

2MI50F-050

SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

MOS-FET MODULE

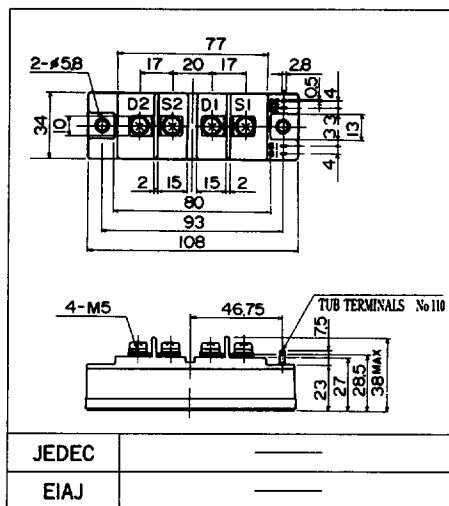
Features

- Low on-resistance
- High current
- Insulated to elements and metal base
- Separated two-elements
- Include fast recovery diode

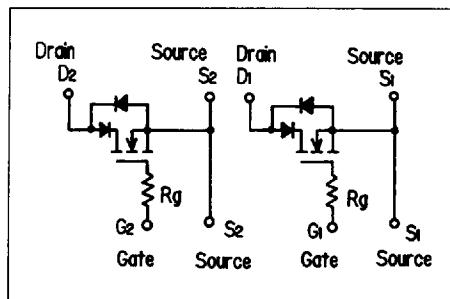
Applications

- Inverters
- UPS
- A. C servo motors
- High frequency power supplies

Outline Drawings



Equivalent Circuit Schematic



Max. Ratings and Characteristics

Absolute Maximum Ratings (Tc=25°C)

| Items | Symbols | Ratings | Units |
|---|----------------------|------------|-------|
| Drain-source voltage | V _{DSS} | 500 | V |
| Continuous drain current Duty=66% | I _D | 50 | A |
| Pulsed drain current | I _{D(puls)} | 150 | A |
| Continuous reverse drain current | I _{DR} | 50 | A |
| Gate-source peak voltage | V _{GSS} | ±20 | V |
| Max. power dissipation | P _D | 400 | W |
| Operating and storage temperature range | T _{ch} | 150 | °C |
| | T _{stg} | -40 ~ +125 | °C |
| Isolation test voltage AC 1min | V _{iso} | 2500 | V |

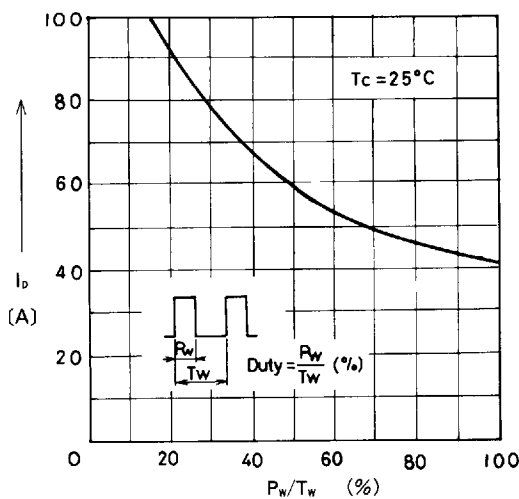
Electrical Characteristics (Tc=25°C)

| Items | Symbols | Test Conditions | Min. | Typ. | Max. | Units |
|--|----------------------|---|------|------|------|-------|
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} =0V I _D =1mA | 500 | | | V |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} I _D =10mA | 2.1 | 3.0 | 4.0 | V |
| Zero gate voltage drain current | I _{DSS} | V _{GS} =0V V _{DS} =500V T _{ch} =25°C | | | 1.0 | mA |
| Gate-source leakage current | I _{GSS} | V _{DS} =0V V _{GS} =±20V | | | 100 | nA |
| Drain-source on-state resistance | R _{DS(on)} | V _{GS} =15V I _D =25A | | | 0.11 | Ω |
| Forward transconductance | g _{fs} | V _{DS} =25V I _D =25A | | 45 | | S |
| Input capacitance | C _{iss} | V _{GS} =0V | | 7.8 | 13 | nF |
| Output capacitance | C _{oss} | V _{DS} =25V | | 0.9 | 1.5 | nF |
| Reverse transfer capacitance | C _{rss} | f=1MHz | | 0.4 | 0.6 | nF |
| Switching time (t _{off} =t _{d(off)} +t _f) | t _{on} | V _{CC} =100V R _G =5Ω | | 530 | 750 | ns |
| | t _{d(off)} | I _D =25A P _w =20μs | | 700 | 1000 | |
| | t _f | V _{GS} =15V | | 80 | 110 | |
| Diode forward on-voltage | V _{SD} | I _F =50A V _{GS} =0V | | 1.4 | 1.8 | V |
| Reverse recovery time | t _{rr} | I _F =50A -di/dt=100A/μs V _{GS} =0V | | | 150 | ns |

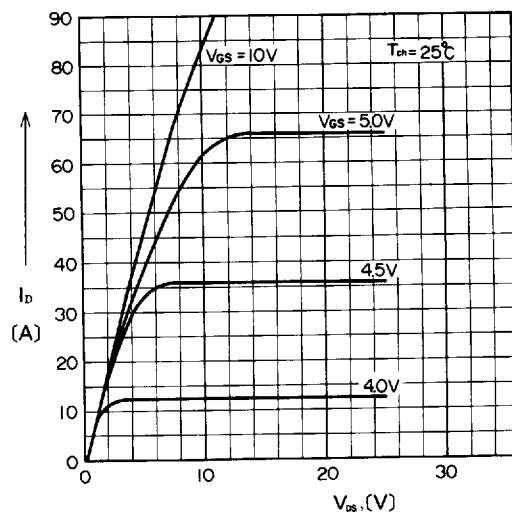
Thermal Characteristics

| Items | Symbols | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|-----------------------|-----------------|------|------|-------|-------|
| Thermal Resistance | R _{th(c-f)} | case to film | | 0.06 | | °C/W |
| | R _{th(ch-c)} | channel to case | | | 0.312 | °C/W |

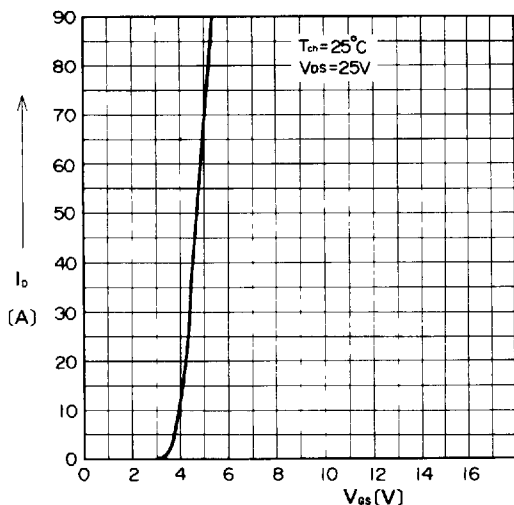
■ Characteristics



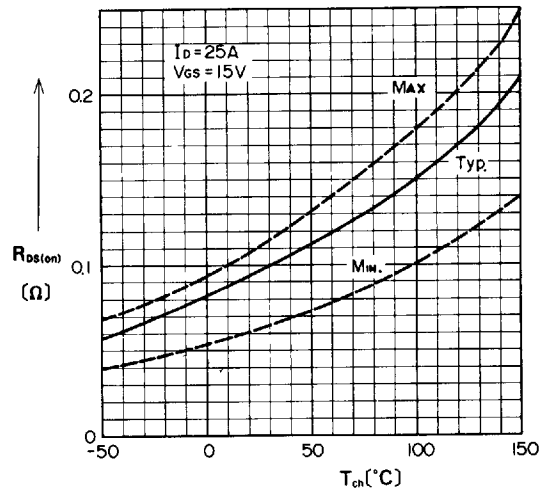
Current Duty Characteristics



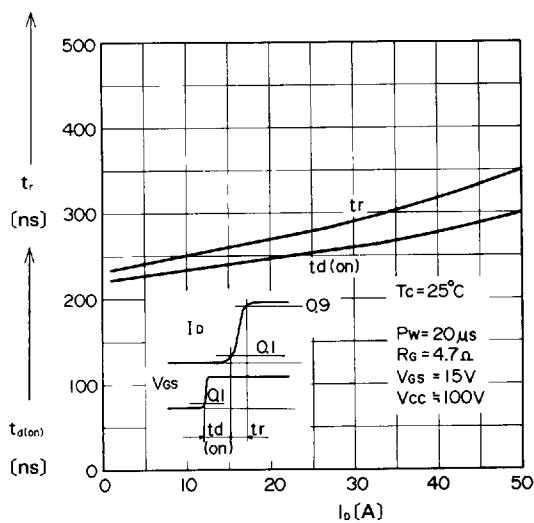
Typical Output Characteristics



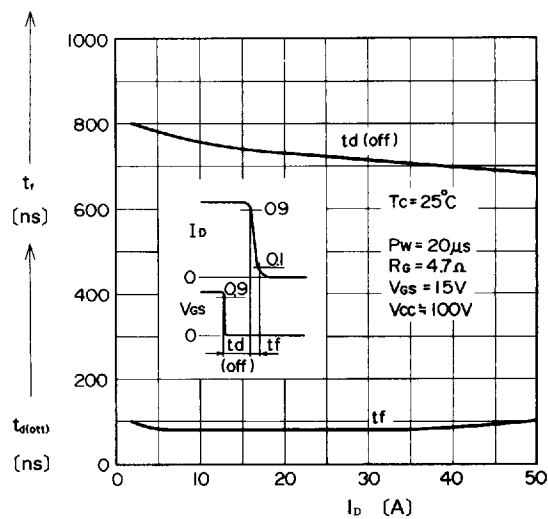
Typical Transfer Characteristics



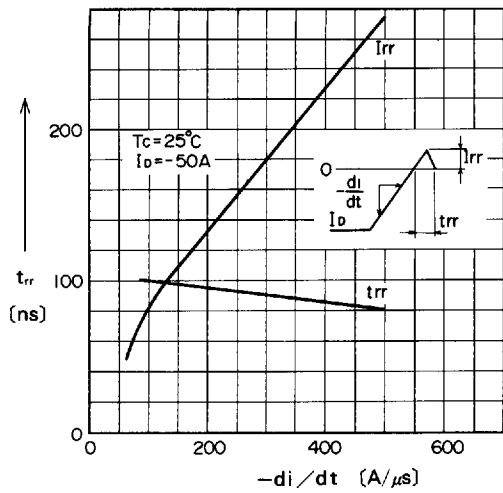
$R_{DS(on)}$ - T_{ch} Characteristics



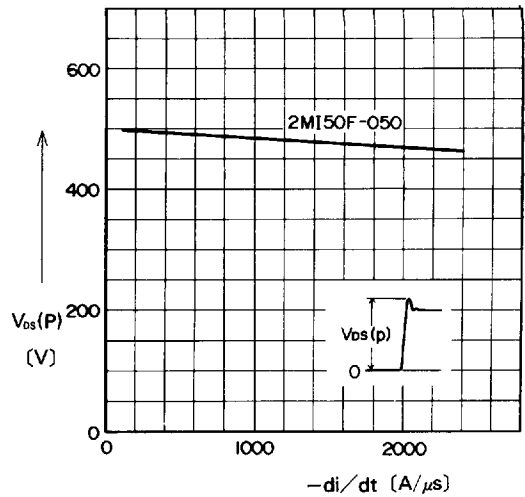
Turn-ON Characteristics



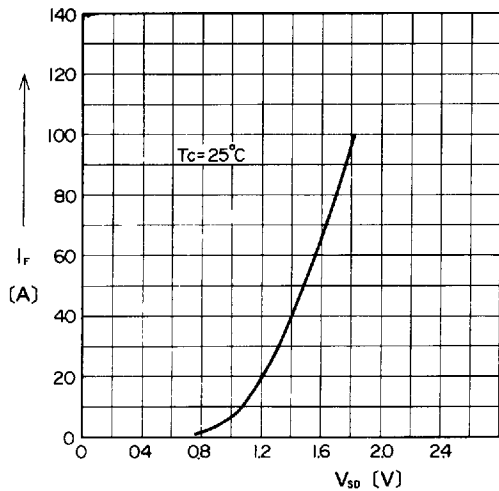
Turn-OFF Characteristics



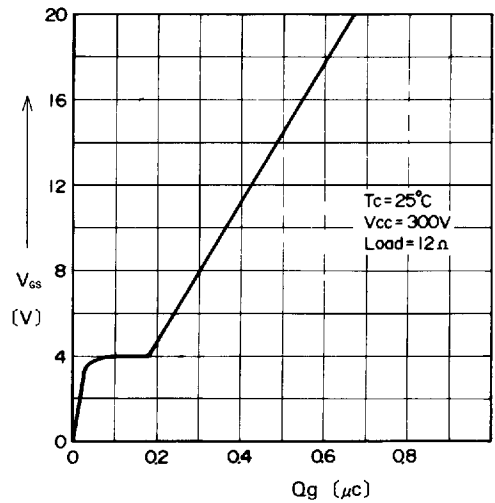
Reverse Recovery Characteristics



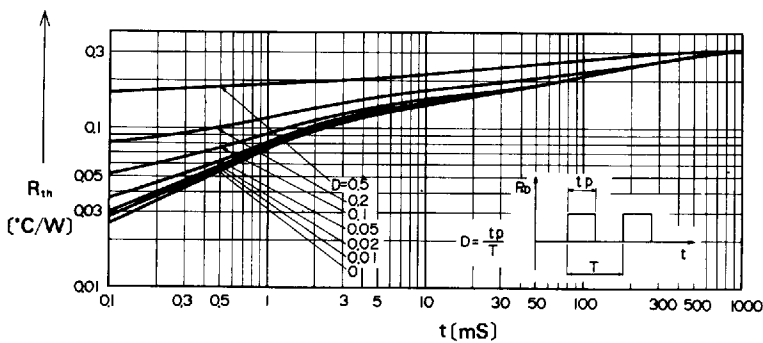
Max. Allowable di/dt at toff



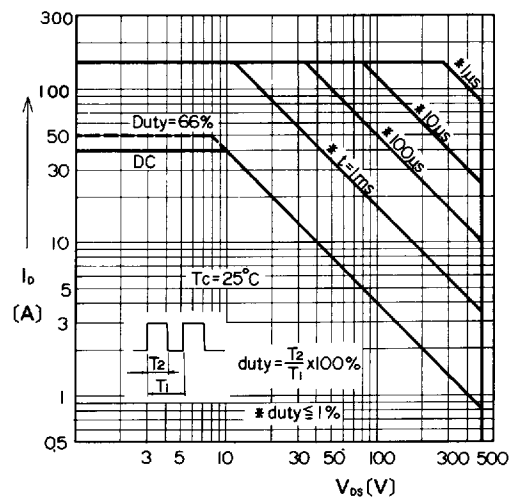
Forward Voltage of FWD



Typical Input Charge



Transient Thermal Impedance



Safe Operating Area