

F5018

FUJI Intelligent Power MOSFET

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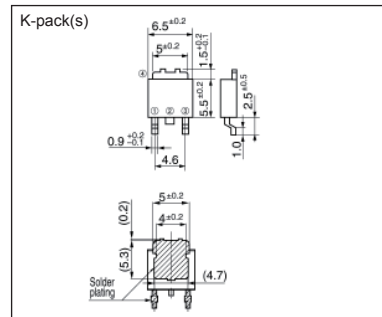
■ Features

- Over temperature protection
- Short circuit protection
- Low on-resistance
- High speed switching

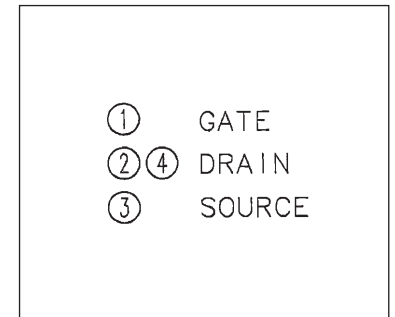
■ Applications

- Solenoid driver
- Lamp driver
- Replacements for fuse and relay

■ Outline drawings [mm]



■ Connection



■ Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C, unless otherwise specified)

| Description | Symbol | Characteristics | Unit | Remarks |
|---|------------------|-----------------|------|--|
| Drain-source voltage | V _{DS} | 40 | V | DC |
| Gate-source voltage | V _{GS} | DC-0.3~7.0 | V | DC |
| Continuous drain current | I _D | 8 | A | T _c =25°C |
| Maximum power dissipation | P _D | 15 | W | T _c =25°C |
| Operating junction temperature | T _J | 150 | °C | — |
| Storage temperature range | T _{stg} | -55 ~ 150 | °C | — |
| Single pulse inductive load switch-off energy dissipation | E _{CL} | 100 | mJ | T _J =150°C, L=5mH, I _D =8A Single pulse, dv/dt≤10V/μs |

● Electrical characteristics (at Tc=25°C unless otherwise specified)

| Description | Symbol | Conditions | min. | typ. | max. | Unit |
|----------------------------------|-----------------------|---|------|------|------|------|
| Drain-source clamp voltage | V _{DS} | I _D =1mA, V _{GS} =0V | 40 | — | 60 | V |
| Gate threshold voltage | V _{GS(th)} | I _D =10mA, V _{DS} =13V | 1.0 | — | 2.8 | V |
| Operation gate voltage | V _{GS(p)} | — | 3.0 | — | 7.0 | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =30V, V _{GS} =0V | — | — | 1.0 | mA |
| Gate-source leakage current | I _{GS(n)*} | V _{GS} =5V | — | — | 500 | μA |
| | I _{GS(un)**} | | — | — | 800 | μA |
| Drain-source on-state resistance | R _{DS(on)} | I _D =5A, V _{GS} =5V | — | — | 140 | mΩ |
| Turn-on time | t _{on} | V _{DS} =13V, R _L =2.6Ω, V _{GS} =5V | — | — | 200 | μs |
| Turn-off time | t _{off} | V _{DS} =13V, R _L =2.6Ω, V _{GS} =5V | — | — | 200 | μs |
| Over-temperature protection | T _{trip} | V _{CC} =13V, V _{GS} =5V | 150 | — | — | °C |
| Short circuit protection | I _{loc} | V _{CC} =13V, V _{GS} =5V | 12 | — | — | A |

Note * : Under normal operation

Note ** : Under self protection

● Electrical characteristics (at Tc=-40~105°C, unless otherwise specified)

| Description | Symbol | Conditions | min. | typ. | max. | Unit |
|--|---------------------|---|------|------|------|------|
| Drain-source clamp voltage | V _{DS} | I _D =1mA, V _{GS} =0V | 38 | — | 62 | V |
| Gate threshold voltage | V _{GS(th)} | I _D =10mA, V _{DS} =13V | 1.0 | — | 3.0 | V |
| Operation gate voltage (protection circuit operates) | V _{GS(p)} | — | 3.0 | — | 6.7 | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =13V, V _{GS} =0V | — | — | 170 | μA |
| | | V _{DS} =30V, V _{GS} =0V | — | — | 1.6 | mA |
| Gate-source leakage current | I _{GS(n)} | V _{GS} =5V* | — | — | 600 | μA |
| | | V _{GS} =5V, T _J >150°C** | — | — | 940 | μA |
| Drain-source on-state resistance | R _{DS(on)} | I _D =5A, V _{GS} =5V | — | — | 205 | mΩ |
| Turn-on time | t _{on} | V _{DS} =13V, I _D =5A, V _{GS} =5V | — | — | 240 | μs |
| Turn-off time | t _{off} | V _{DS} =13V, I _D =5A, V _{GS} =5V | — | — | 220 | μs |
| Short circuit protection | I _{loc} | V _{GS} =5V | 8.4 | — | — | A |

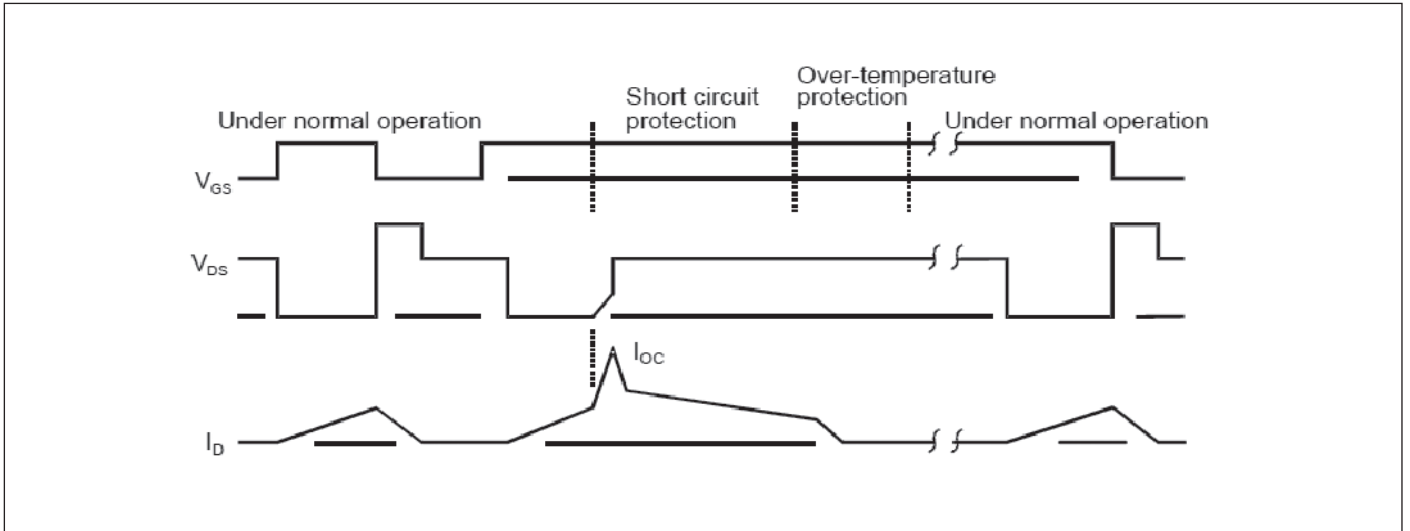
Note * : Under normal operation

Note ** : Under self protection (Short circuit ~ Short circuit protection ~ Over-temperature protection)

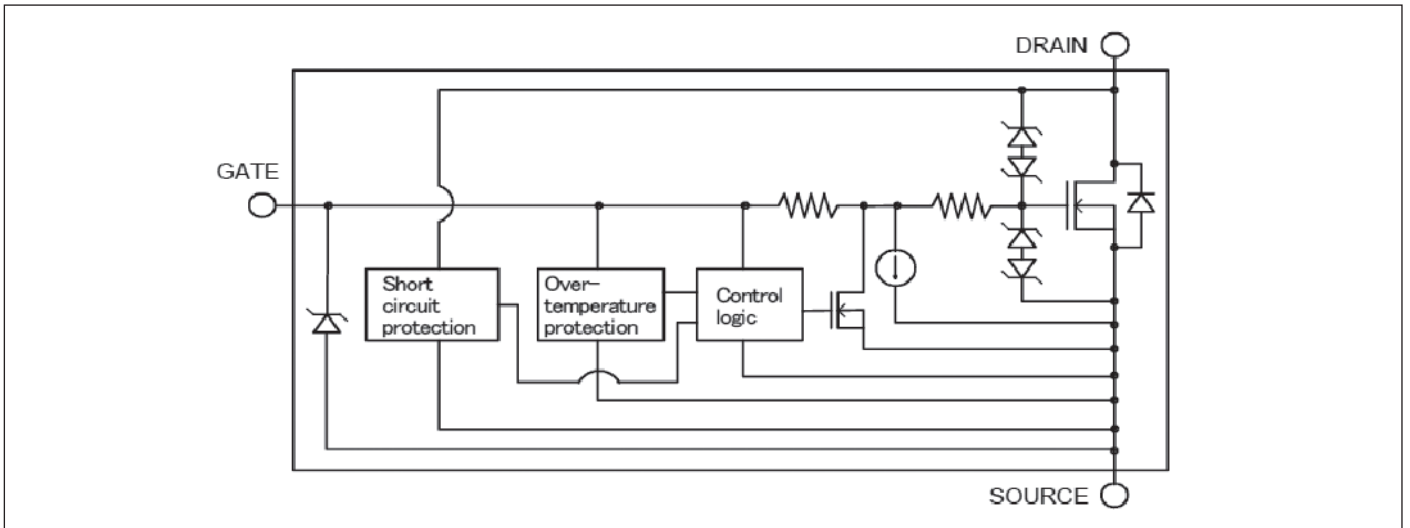
● Thermal resistance

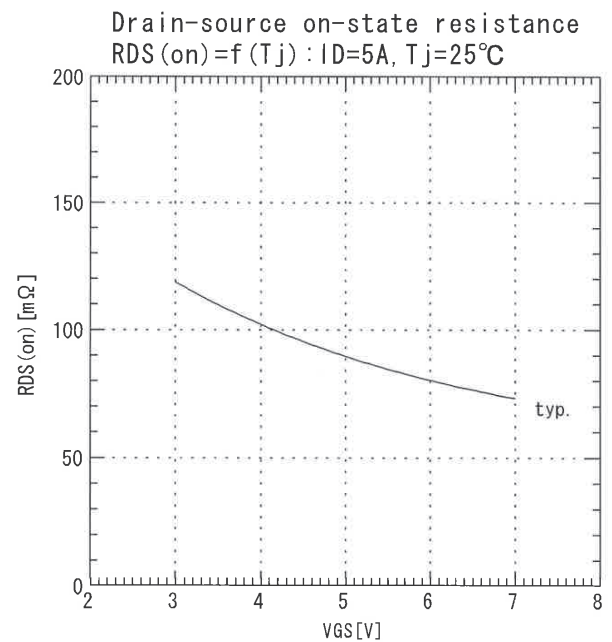
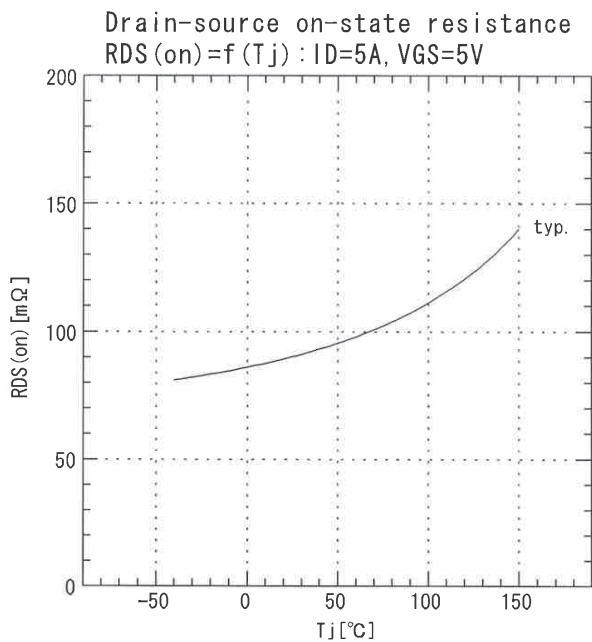
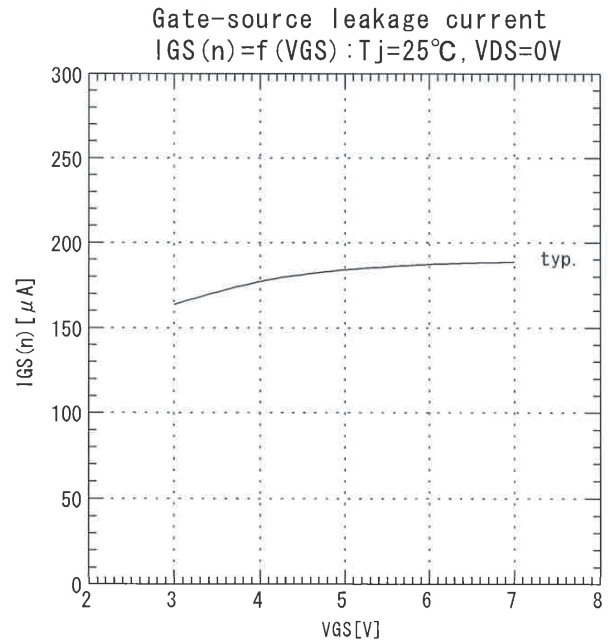
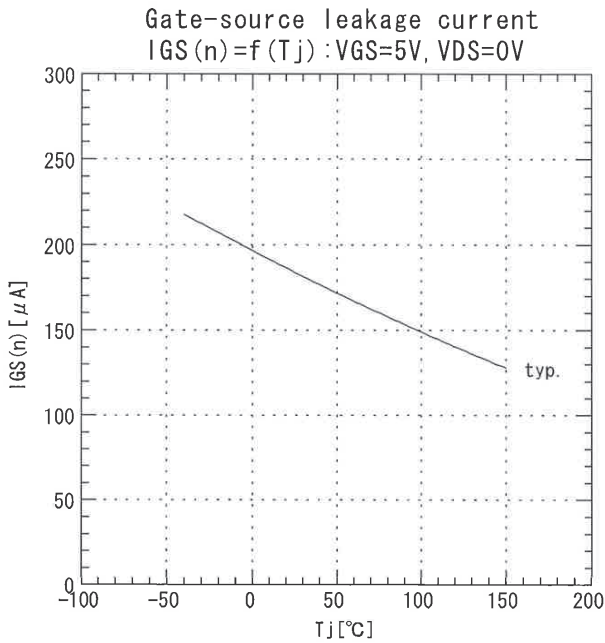
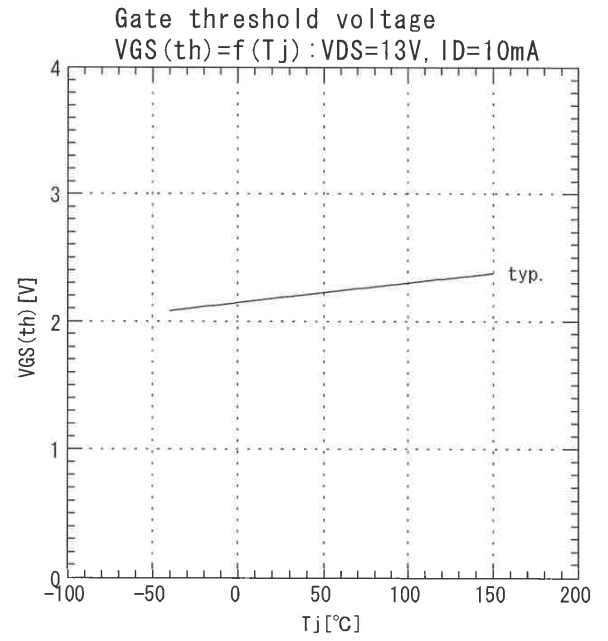
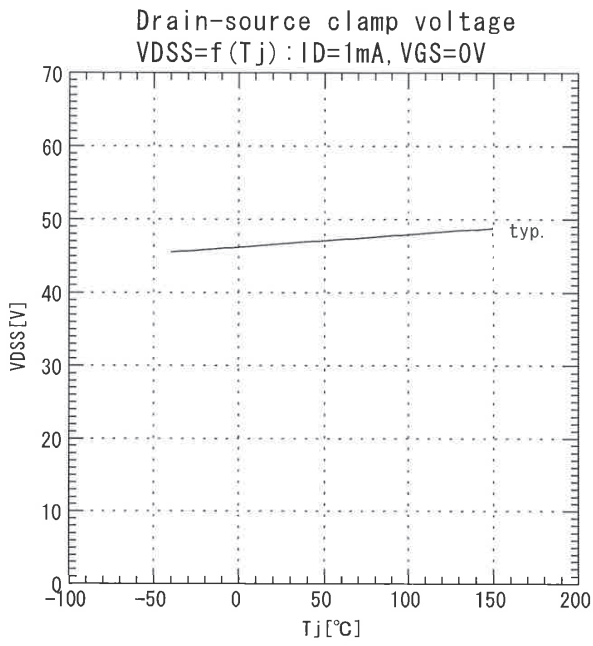
| Description | Symbol | Test conditions | min. | typ. | max. | Unit |
|--------------------|----------------------|------------------|------|------|------|------|
| Thermal resistance | R _{th(j-c)} | Junction-case | — | — | 8.3 | °C/W |
| | R _{th(j-a)} | Junction-ambient | — | — | 125 | °C/W |

■ Timing chart

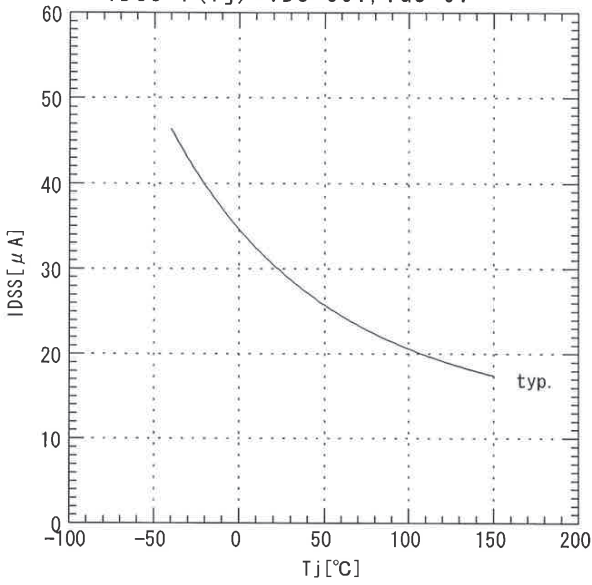


■ Circuit block diagram

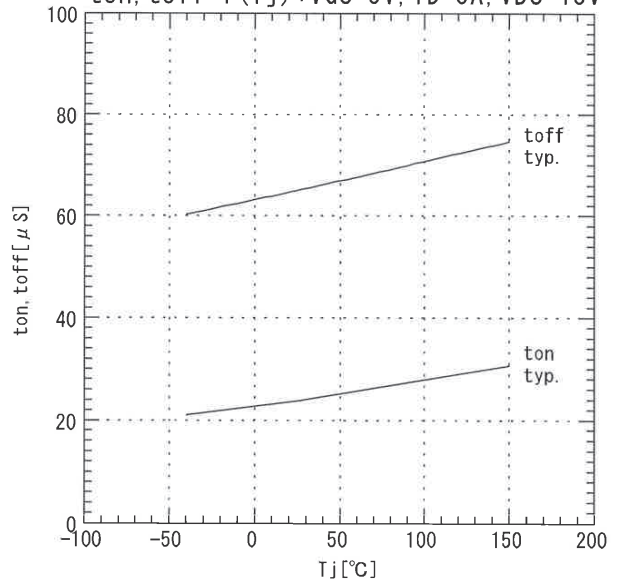




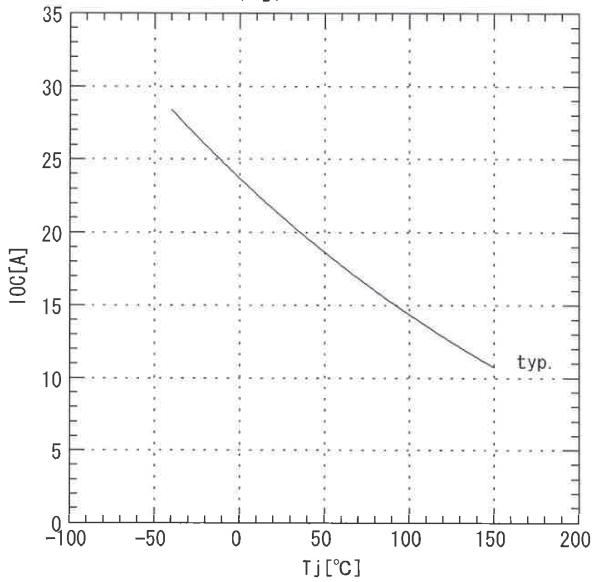
Zero gate voltage drain current
 $I_{DSS}=f(T_j) : V_{DS}=30V, V_{GS}=0V$



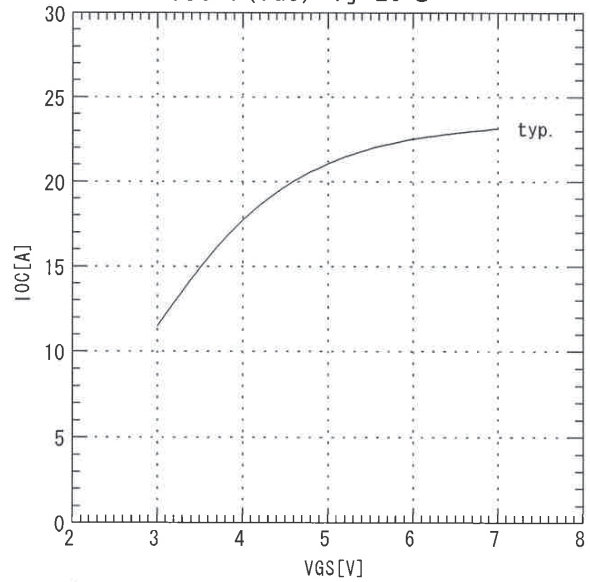
Turn-on time, Turn-off time
 $t_{on}, t_{off}=f(T_j) : V_{GS}=5V, I_D=5A, V_{DS}=13V$



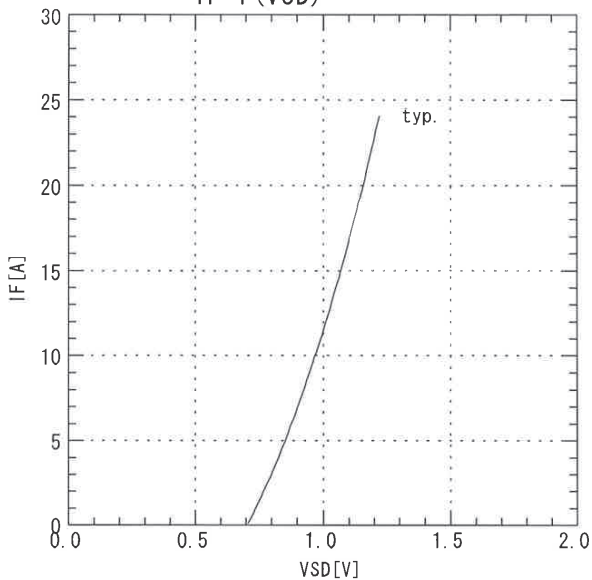
Short circuit detection
 $I_{OC}=f(T_j) : V_{GS}=5V$



Short circuit detection
 $I_{OC}=f(V_{GS}) : T_j=25°C$



Forward on voltage
 $I_F=f(V_{SD})$



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