

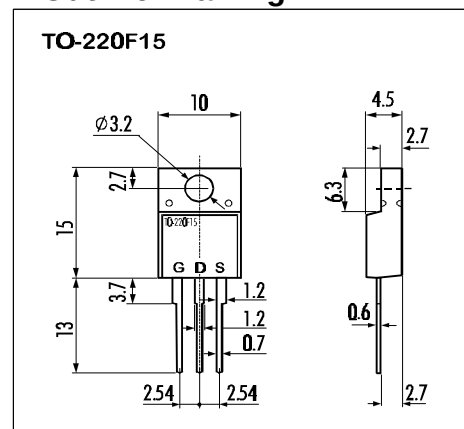
### > Features

- High Speed Switching
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Voltage
- $V_{GS} = \pm 30V$  Guarantee
- Avalanche Proof

### > Applications

- Switching Regulators
- UPS
- DC-DC converters
- General Purpose Power Amplifier

### > Outline Drawing

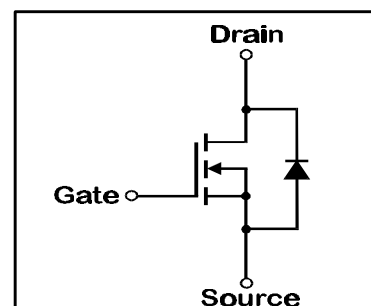


### > Maximum Ratings and Characteristics

- Absolute Maximum Ratings ( $T_C=25^\circ C$ ), unless otherwise specified

| Item                                     | Symbol        | Rating     | Unit       |
|------------------------------------------|---------------|------------|------------|
| Drain-Source-Voltage                     | $V_{DS}$      | 600        | V          |
| Drain-Gate-Voltage( $R_{GS}=20K\Omega$ ) | $V_{DGR}$     | 600        | V          |
| Continuous Drain Current                 | $I_D$         | 4          | A          |
| Pulsed Drain Current                     | $I_{D(puls)}$ | 16         | A          |
| Gate-Source-Voltage                      | $V_{GS}$      | $\pm 30$   | V          |
| Max. Power Dissipation                   | $P_D$         | 40         | W          |
| Operating and Storage Temperature Range  | $T_{ch}$      | 150        | $^\circ C$ |
|                                          | $T_{stg}$     | -55 ~ +150 | $^\circ C$ |

### > Equivalent Circuit



- Electrical Characteristics ( $T_C=25^\circ C$ ), unless otherwise specified

| Item                                                 | Symbol        | Test conditions                                                | Min. | Typ. | Max. | Unit     |
|------------------------------------------------------|---------------|----------------------------------------------------------------|------|------|------|----------|
| Drain-Source Breakdown-Voltage                       | $V_{(BR)DSS}$ | $I_D=1mA$ $V_{GS}=0V$                                          | 600  |      |      | V        |
| Gate Threshold Voltage                               | $V_{GS(th)}$  | $I_D=1mA$ $V_{DS}=V_{GS}$                                      | 2,5  | 3,0  | 3,5  | V        |
| Zero Gate Voltage Drain Current                      | $I_{DSS}$     | $V_{DS}=600V$ $T_{ch}=25^\circ C$                              |      | 10   | 500  | $\mu A$  |
|                                                      |               | $V_{GS}=0V$ $T_{ch}=125^\circ C$                               |      | 0,2  | 1,0  | mA       |
| Gate Source Leakage Current                          | $I_{GSS}$     | $V_{GS}=\pm 30V$ $V_{DS}=0V$                                   |      | 10   | 100  | nA       |
| Drain Source On-State Resistance                     | $R_{DS(on)}$  | $I_D=2A$ $V_{GS}=10V$                                          |      | 2    | 2,4  | $\Omega$ |
| Forward Transconductance                             | $g_{fs}$      | $I_D=2A$ $V_{DS}=25V$                                          | 2    | 4    |      | S        |
| Input Capacitance                                    | $C_{iss}$     | $V_{DS}=25V$                                                   |      | 1000 | 1500 | pF       |
| Output Capacitance                                   | $C_{oss}$     | $V_{GS}=0V$                                                    |      | 85   | 130  | pF       |
| Reverse Transfer Capacitance                         | $C_{rss}$     | $f=1MHz$                                                       |      | 20   | 30   | pF       |
| Turn-On-Time $t_{on}$ ( $t_{on}=t_{d(on)}+t_r$ )     | $t_{d(on)}$   | $V_{CC}=300V$<br>$I_D=4A$<br>$V_{GS}=10V$<br>$R_{GS}=10\Omega$ |      | 20   | 30   | ns       |
|                                                      | $t_r$         |                                                                |      | 15   | 25   | ns       |
| Turn-Off-Time $t_{off}$ ( $t_{off}=t_{d(off)}+t_f$ ) | $t_{d(off)}$  |                                                                |      | 45   | 70   | ns       |
|                                                      | $t_f$         |                                                                |      | 15   | 25   | ns       |
| Avalanche Capability                                 | $I_{AV}$      | $L=100\mu H$ $T_{ch}=25^\circ C$                               | 4    |      |      | A        |
| Continuous Reverse Drain Current                     | $I_{DR}$      |                                                                |      |      | 4    | A        |
| Pulsed Reverse Drain Current                         | $I_{DRM}$     |                                                                |      |      | 16   | A        |
| Diode Forward On-Voltage                             | $V_{SD}$      | $I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$                  |      | 1,1  | 1,65 | V        |
| Reverse Recovery Time                                | $t_{rr}$      | $I_F=I_{DR}$ $V_{GS}=0V$                                       |      | 400  |      | ns       |
| Reverse Recovery Charge                              | $Q_{rr}$      | $-dI_F/dt=100A/\mu s$ $T_{ch}=25^\circ C$                      |      | 2    |      | $\mu C$  |

- Thermal Characteristics

| Item               | Symbol         | Test conditions | Min. | Typ. | Max.  | Unit         |
|--------------------|----------------|-----------------|------|------|-------|--------------|
| Thermal Resistance | $R_{th(ch-a)}$ | channel to air  |      |      | 62,5  | $^\circ C/W$ |
|                    | $R_{th(ch-c)}$ | channel to case |      |      | 3,125 | $^\circ C/W$ |

| N-channel MOS-FET |      |    |     |
|-------------------|------|----|-----|
| 600V              | 2,4Ω | 4A | 40W |

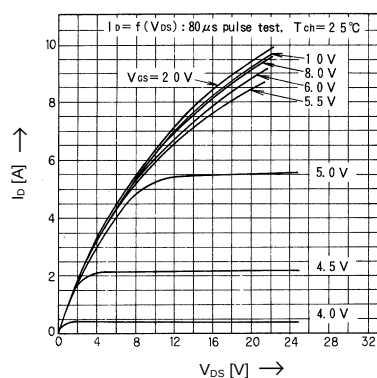
# 2SK2003-01MR

## FAP-IIA Series

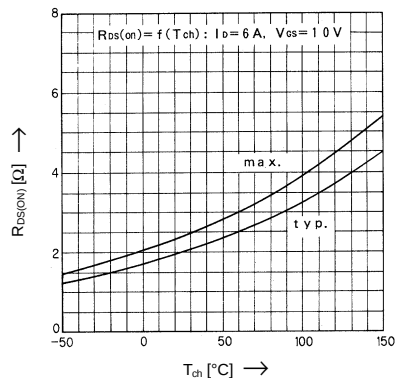
**FUJI**  
ELECTRIC

### > Characteristics

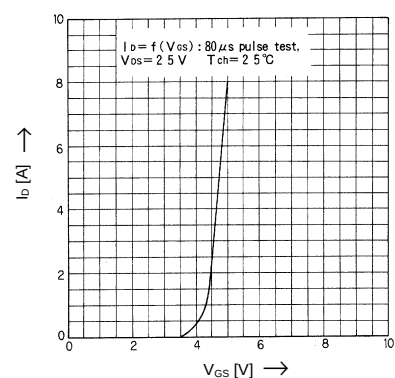
Typical Output Characteristics



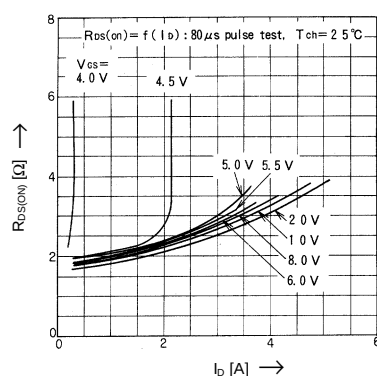
Drain-Source-On-State Resistance vs.  $T_{ch}$



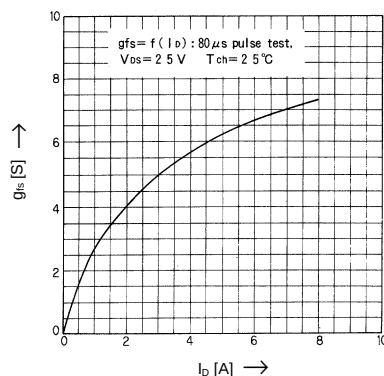
Typical Transfer Characteristics



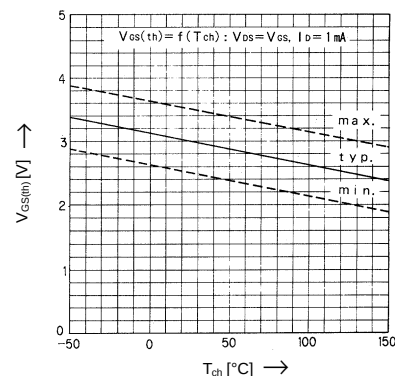
Typical Drain-Source-On-State-Resistance vs.  $I_D$



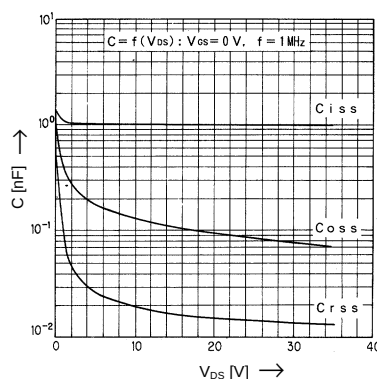
Typical Forward Transconductance vs.  $I_D$



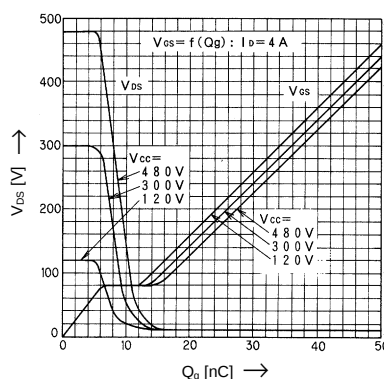
Gate Threshold Voltage vs.  $T_{ch}$



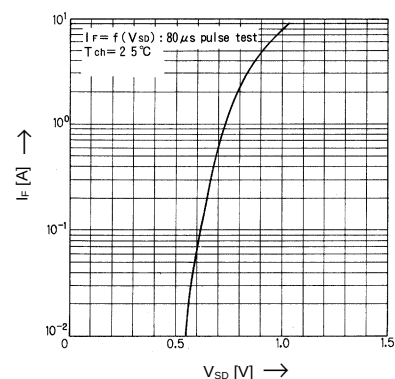
Typical Capacitance vs.  $V_{DS}$



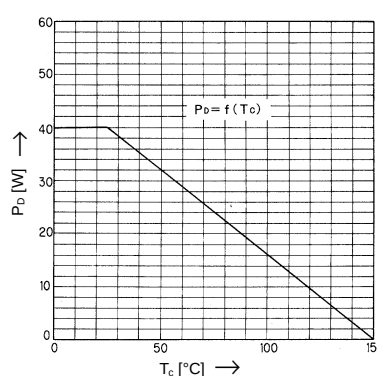
Typical Input Charge



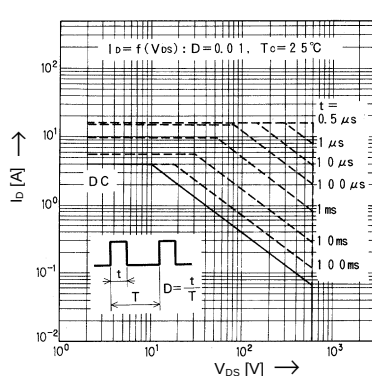
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs.  $T_c$



Safe operation area



Transient Thermal impedance

