FUJI ELECTRIC

# 2SK2027-01

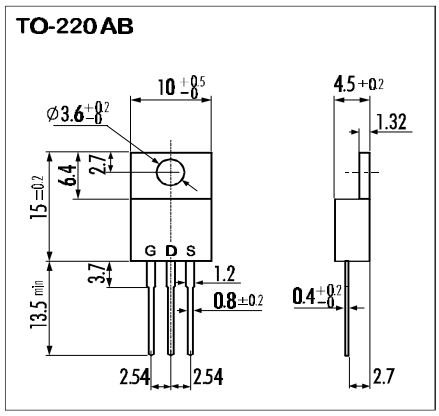
## FAP-IIA Series

| N-channel MOS-FET | | | |
|---|---|---|---|
| 600V | 1,2Ω | 8A | 80W |

## > Features

- High Speed Switching
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Voltage
- VGS = ± 30V Guarantee
- Avalanche Proof

## > Outline Drawing




## > Applications

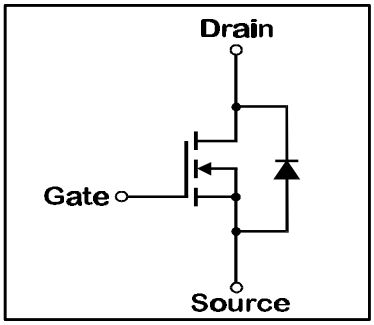
- Switching Regulators
- UPS
- DC-DC converters
- General Purpose Power Amplifier

## > Maximum Ratings and Characteristics

- Absolute Maximum Ratings ($T_C$=25°C), unless otherwise specified

| Item | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source-Voltage | $V_{DS}$ | 600 | V |
| Drain-Gate-Voltage ($R_{GS}$=20KΩ) | $V_{DGR}$ | 600 | V |
| Continous Drain Current | $I_D$ | 8 | A |
| Pulsed Drain Current | $I_{D(puls)}$ | 32 | A |
| Gate-Source-Voltage | $V_{GS}$ | ±30 | V |
| Max. Power Dissipation | $P_D$ | 80 | W |
| Operating and Storage Temperature Range | $T_{ch}$ | 150 | °C |
| | $T_{stg}$ | -55 ~ +150 | °C |

## > Equivalent Circuit




- Electrical Characteristics ($T_C$=25°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 Threshhold 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°C | | 10 | 500 | µA |
| | | $V_{GS}$=0V $T_{ch}$=125°C | | 0,2 | 1,0 | mA |
| Gate Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±30V $V_{DS}$=0V | | 10 | 100 | nA |
| Drain Source On-State Resistance | $R_{DS(on)}$ | $I_D$=4A $V_{GS}$=10V | | 1,0 | 1,2 | Ω |
| Forward Transconductance | $g_{fs}$ | $I_D$=4A $V_{DS}$=25V | 4 | 8 | | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V | | 1500 | 2200 | pF |
| Output Capacitance | $C_{oss}$ | $V_{GS}$=0V | | 140 | 210 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | f=1MHz | | 30 | 45 | pF |
| Turn-On-Time $t_{on}$ ($t_{on}$=$t_{d(on)}$+$t_r$) | $t_{d(on)}$ | $V_{CC}$=300V | | 20 | 30 | ns |
| | $t_r$ | $I_D$=8A | | 30 | 45 | ns |
| Turn-Off-Time $t_{off}$ ($t_{on}$=$t_{d(off)}$+$t_f$) | $t_{d(off)}$ | $V_{GS}$=10V | | 90 | 135 | ns |
| | $t_f$ | $R_{GS}$=10 Ω | | 50 | 75 | ns |
| Avalanche Capability | $I_{AV}$ | L = 100µH $T_{ch}$=25°C | 8 | | | A |
| Continous Reverse Drain Current | $I_{DR}$ | | | | 8 | A |
| Pulsed Reverse Drain Current | $I_{DRM}$ | | | | 32 | A |
| Diode Forward On-Voltage | $V_{SD}$ | $I_F$=2x$I_{DR}$ $V_{GS}$=0V $T_{ch}$=25°C | | 1,0 | 1,5 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=$I_{DR}$ $V_{GS}$=0V | | 450 | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | -$dI_F$/dt=100A/µs $T_{ch}$=25°C | | 3 | | µC |

- Thermal Characteristics

| Item | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Thermal Resistance | $R_{th(ch-a)}$ | channel to air | | | 75 | °C/W |
| | $R_{th(ch-c)}$ | channel to case | | | 1,56 | °C/W |

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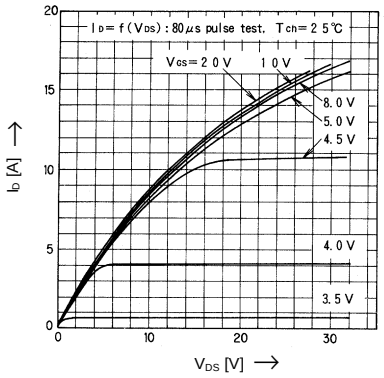
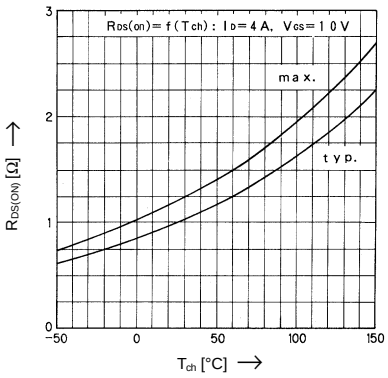
## > Characteristics

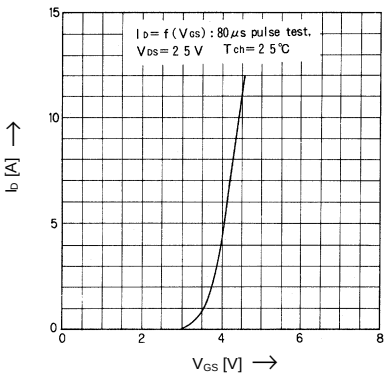
Typical Output Characteristics



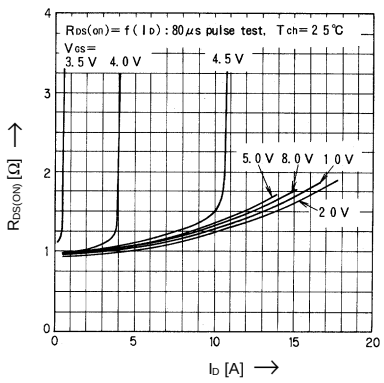

Drain-Source-On-State Resistance vs. $T_{ch}$



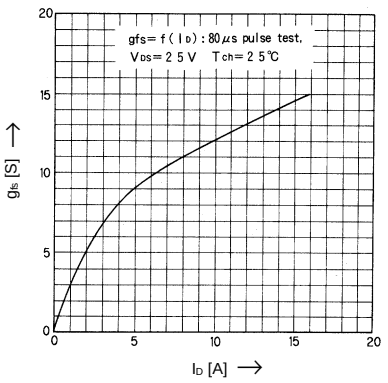

Typical Transfer Characteristics



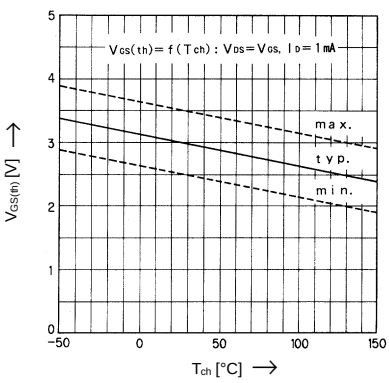

Typical Drain-Source-On-State-Resistance vs. $I_D$



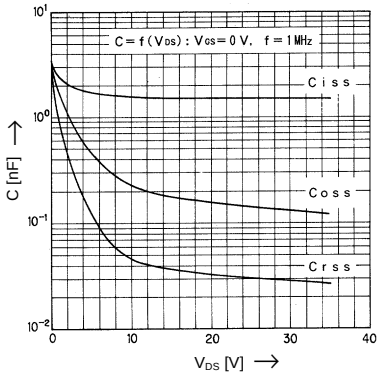

Typical Forward Transconductance vs. $I_D$



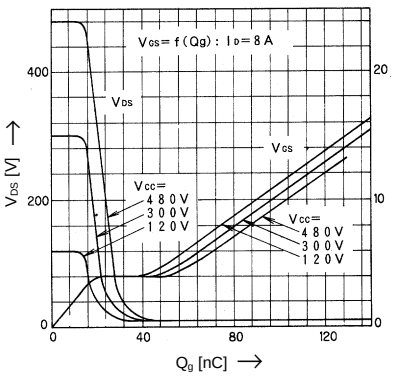

Gate Threshold Voltage vs. $T_{ch}$



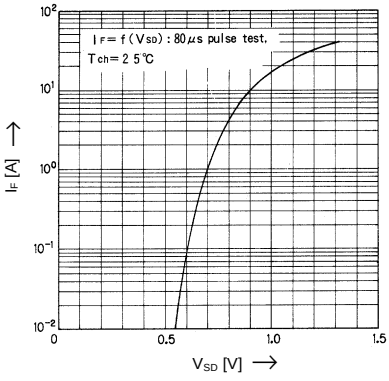

Typical Capacitance vs. $V_{DS}$



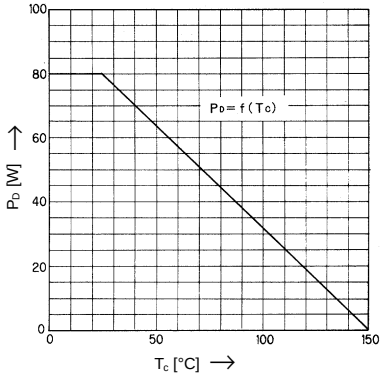

Typical Input Charge



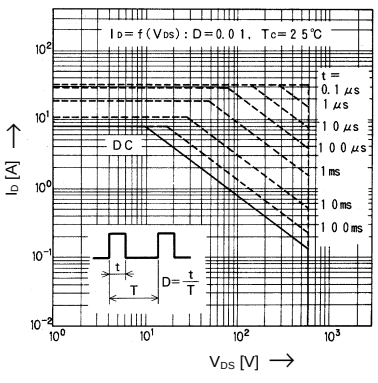

Forward Characteristics of Reverse Diode




Allowable Power Dissipation vs. $T_C$




Safe operation area




Transient Thermal impedance