

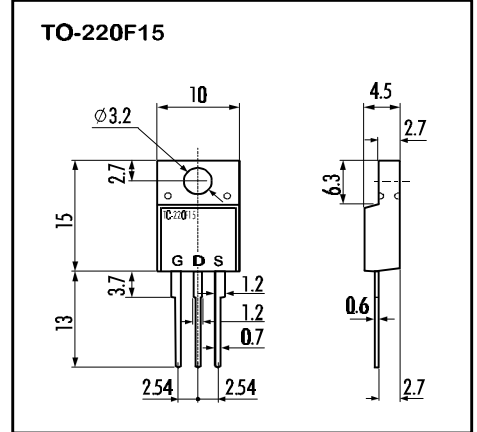
> Features

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

> Applications

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

> Outline Drawing

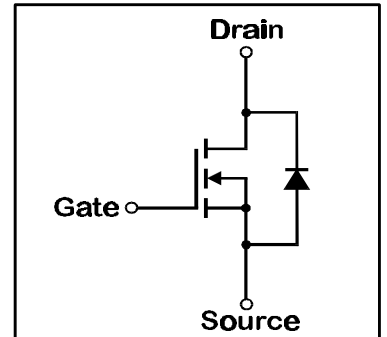


> Maximum Ratings and Characteristics

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

| Item | Symbol | Rating | Unit |
|------------------------------------------------------------|---------------|------------|------------|
| Drain-Source-Voltage | V_{DS} | 600 | V |
| Continous Drain Current | I_D | 9 | A |
| Pulsed Drain Current | $I_{D(puls)}$ | 32 | A |
| Gate-Source-Voltage | V_{GS} | ± 30 | V |
| Repetitive or Non-Repetitive ($T_{ch} \leq 150^\circ C$) | I_{AR} | 9 | A |
| Avalanche Energy | E_{AS} | 71,9 | mJ |
| Max. Power Dissipation | P_D | 50 | 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 | $V_{GS(th)}$ | $I_D=1mA$ $V_{DS}=V_{GS}$ | 3,5 | 4,0 | 4,5 | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=600V$ $T_{ch}=25^\circ C$ | | 10 | 500 | μA |
| | | $V_{GS}=0V$ $T_{ch}=125^\circ C$ | | 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 | $R_{DS(on)}$ | $I_D=4A$ $V_{GS}=10V$ | | 1,0 | 1,2 | Ω |
| Forward Transconductance | g_{fs} | $I_D=4A$ $V_{DS}=25V$ | 2,5 | 5 | | S |
| Input Capacitance | C_{iss} | $V_{DS}=25V$ | | 900 | 1400 | pF |
| Output Capacitance | C_{oss} | $V_{GS}=0V$ | | 150 | 230 | pF |
| Reverse Transfer Capacitance | C_{rss} | $f=1MHz$ | | 70 | 110 | pF |
| Turn-On-Time t_{on} ($t_{on}=t_{d(on)}+t_r$) | $t_{d(on)}$ | $V_{CC}=300V$ | | 25 | 40 | ns |
| | t_r | $I_D=9A$ | | 70 | 110 | ns |
| Turn-Off-Time t_{off} ($t_{off}=t_{d(off)}+t_f$) | $t_{d(off)}$ | $V_{GS}=10V$ | | 60 | 90 | ns |
| | t_f | $R_{GS}=10 \Omega$ | | 35 | 60 | ns |
| Avalanche Capability | I_{AV} | $L = 100\mu H$ $T_{ch}=25^\circ C$ | 9 | | | A |
| Diode Forward On-Voltage | V_{SD} | $I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$ | | 1,0 | 1,5 | V |
| Reverse Recovery Time | t_{rr} | $I_F=I_{DR}$ $V_{GS}=0V$ | | 550 | | ns |
| Reverse Recovery Charge | Q_{rr} | $-di_F/dt=100A/\mu s$ $T_{ch}=25^\circ C$ | | 7,0 | | μC |

- 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 | | | 2,5 | $^\circ C/W$ |

| | | | |
|-------------------|------|----|-----|
| N-channel MOS-FET | | | |
| 600V | 1,2Ω | 9A | 50W |

2SK2645-01MR

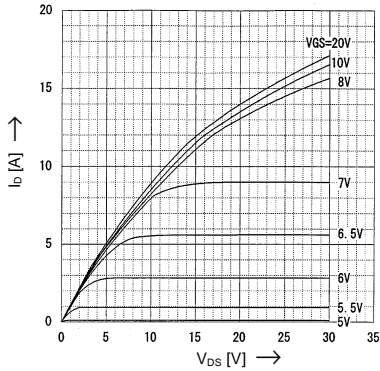
FAP-IIS Series



> Characteristics

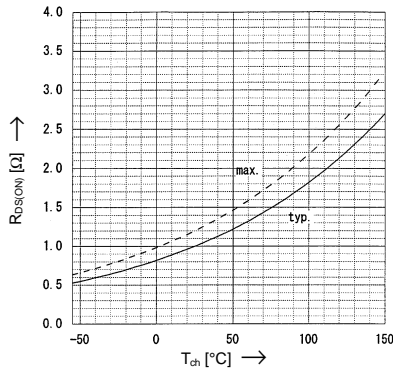
Typical Output Characteristics

$I_D=f(V_{DS})$; 80μs pulse test; $T_C=25^\circ\text{C}$



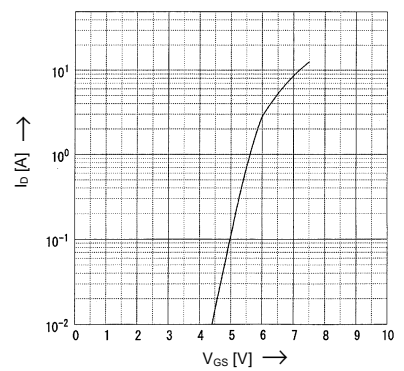
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)} = f(T_{ch})$; $I_D=4\text{A}$; $V_{GS}=10\text{V}$



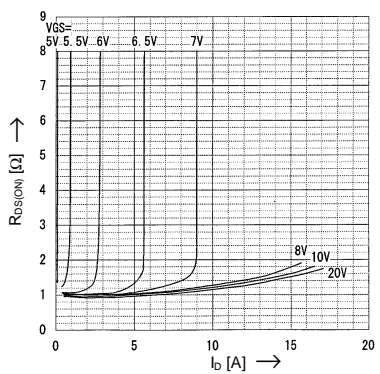
Typical Transfer Characteristics

$I_D=f(V_{GS})$; 80μs pulse test; $V_{DS}=25\text{V}$; $T_{ch}=25^\circ\text{C}$



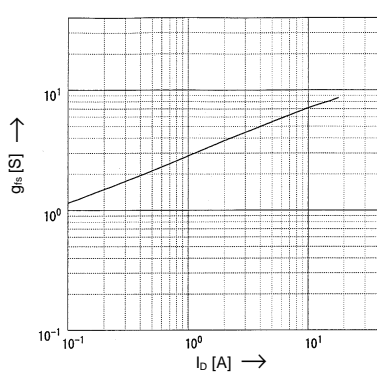
Typical Drain-Source On-State-Resistance vs. I_D

$R_{DS(on)}=f(I_D)$; 80μs pulse test; $T_C=25^\circ\text{C}$



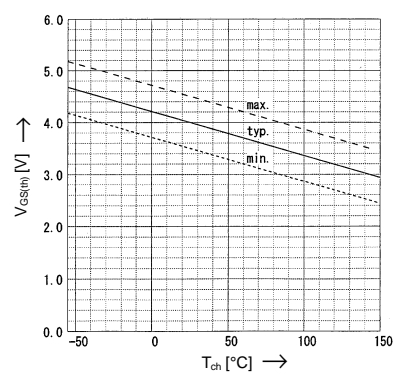
Typical Forward Transconductance vs. I_D

$g_{fs}=f(I_D)$; 80μs pulse test; $V_{DS}=25\text{V}$; $T_{ch}=25^\circ\text{C}$



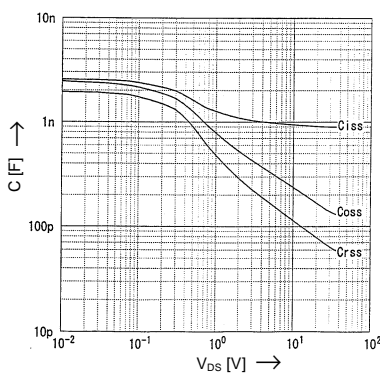
Gate Threshold Voltage vs. T_{ch}

$V_{GS(th)}=f(T_{ch})$; $I_D=1\text{mA}$; $V_{DS}=V_{GS}$



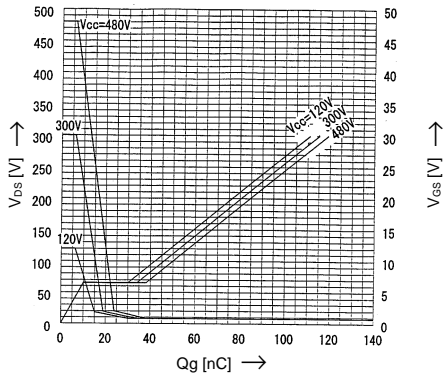
Typical Capacitances vs. V_{DS}

$C=f(V_{DS})$; $V_{GS}=0\text{V}$; $f=1\text{MHz}$



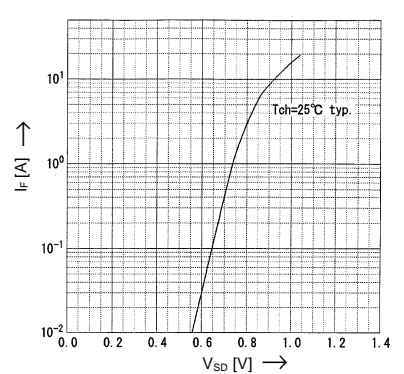
Typical Gate Charge Characteristic

$V_{GS}=f(Q_g)$; $I_D=9\text{A}$; $T_C=25^\circ\text{C}$



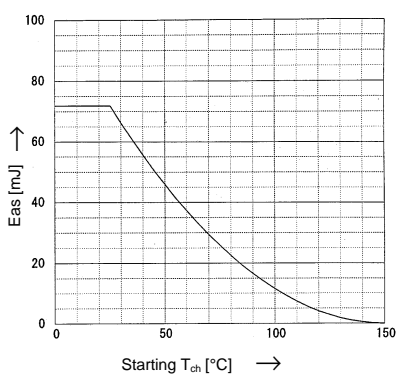
Forward Characteristics of Reverse Diode

$I_F=f(V_{SD})$; 80μs pulse test; $V_{GS}=0\text{V}$



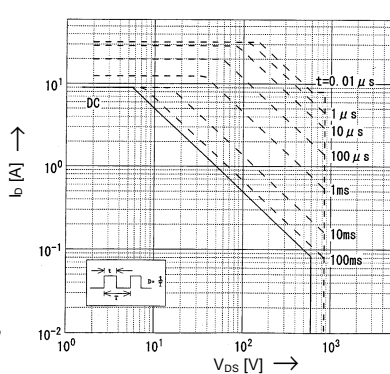
Avalanche Energy Derating

$E_{as}=f(\text{starting } T_{ch})$; $V_{CC}=60\text{V}$; $I_A=9\text{A}$



Safe Operation Area

$I_D=f(V_{DS})$; $D=0.01$; $T_C=25^\circ\text{C}$



Transient Thermal Impedance

$Z_{th(ch-e)}=f(t)$ parameter: $D=t/T$

