

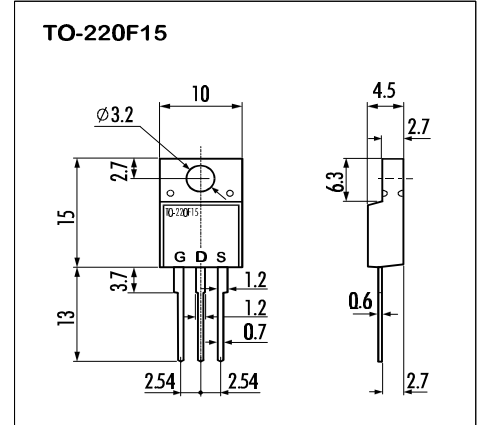
**> Features**

- 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**

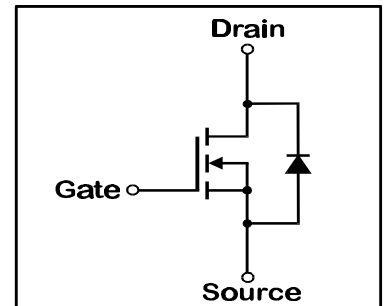


**> Maximum Ratings and Characteristics**

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

| Item                                     | Symbol        | Rating     | Unit       |
|--|---------------|------------|------------|
| Drain-Source-Voltage                     | $V_{DS}$      | 200        | V          |
| Drain-Gate-Voltage( $R_{GS}=20K\Omega$ ) | $V_{DGR}$     | 200        | V          |
| Continous Drain Current                  | $I_D$         | 20         | A          |
| Pulsed Drain Current                     | $I_{D(puls)}$ | 80         | A          |
| Gate-Source-Voltage                      | $V_{GS}$      | $\pm 30$   | V          |
| 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                       | $V_{(BR)DSS}$ | $I_D=1mA$ $V_{GS}=0V$                         | 200  |      |      | 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                      | $I_{DSS}$     | $V_{DS}=200V$ $T_{ch}=25^\circ C$             |      | 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                     | $R_{DS(on)}$  | $I_D=10A$ $V_{GS}=10V$                        |      | 0,1  | 0,13 | $\Omega$ |
| Forward Transconductance                             | $g_{fs}$      | $I_D=10A$ $V_{DS}=25V$                        | 7,0  | 15,0 |      | S        |
| Input Capacitance                                    | $C_{iss}$     | $V_{DS}=25V$                                  |      | 1800 | 2700 | pF       |
| Output Capacitance                                   | $C_{oss}$     | $V_{GS}=0V$                                   |      | 320  | 480  | pF       |
| Reverse Transfer Capacitance                         | $C_{rss}$     | $f=1MHz$                                      |      | 80   | 120  | pF       |
| Turn-On-Time $t_{on}$ ( $t_{on}=t_{d(on)}+t_r$ )     | $t_{d(on)}$   | $V_{CC}=150V$<br>$I_D=20A$                    |      | 15   | 25   | ns       |
|  | $t_r$         |   |      | 60   | 90   | ns       |
| Turn-Off-Time $t_{off}$ ( $t_{off}=t_{d(off)}+t_f$ ) | $t_{d(off)}$  | $V_{GS}=10V$<br>$R_{GS}=10\Omega$             |      | 65   | 100  | ns       |
|  | $t_f$         |   |      | 60   | 90   | ns       |
| Avalanche Capability                                 | $I_{AV}$      | $L=100\mu H$ $T_{ch}=25^\circ C$              | 20,0 |      |      | A        |
| Diode Forward On-Voltage                             | $V_{SD}$      | $I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$ |      | 1,06 | 1,59 | V        |
| Reverse Recovery Time                                | $t_{rr}$      | $I_F=I_{DR}$ $V_{GS}=0V$                      |      | 145  |      | ns       |
| Reverse Recovery Charge                              | $Q_{rr}$      | $-dI_F/dt=100A/\mu s$ $T_{ch}=25^\circ C$     |      | 900  |      | $\mu C$  |

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

|                   |       |     |     |
|-------------------|-------|-----|-----|
| N-channel MOS-FET |       |     |     |
| 200V              | 0,13Ω | 20A | 50W |

# 2SK2518-01MR

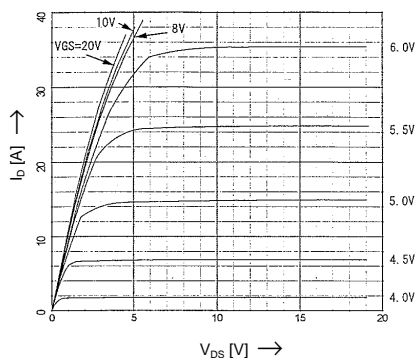
## FAP-IIA Series



### > Characteristics

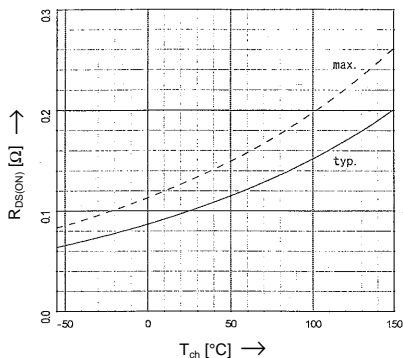
Typical Output Characteristics

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



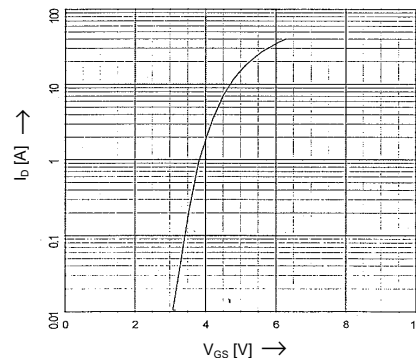
Drain-Source On-State Resistance

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



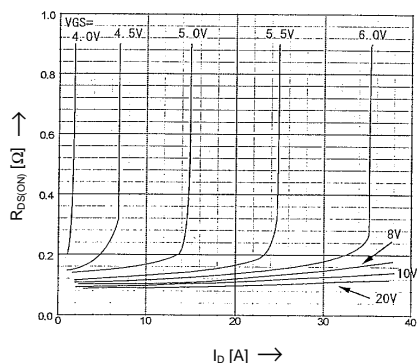
Typical Transfer Characteristics

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



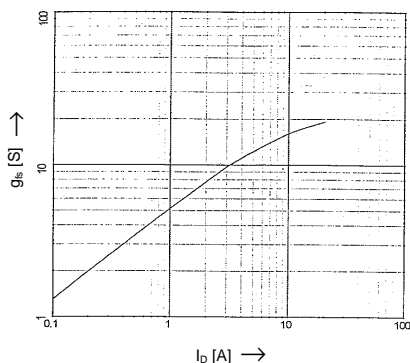
Typical Drain-Source On-State-Resistance

$R_{DS(on)} = f(I_D); T_C = 25^\circ C$



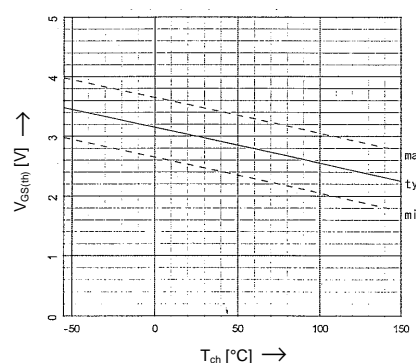
Typical Transconductance

$g_m = f(I_D); 80\mu s$  pulse test;  $V_{DS} = 25V; T_{ch} = 25^\circ C$



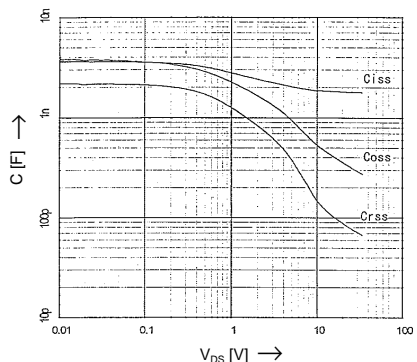
Gate Threshold Voltage

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



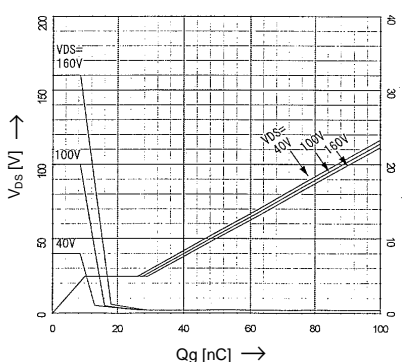
Typical Capacitances

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



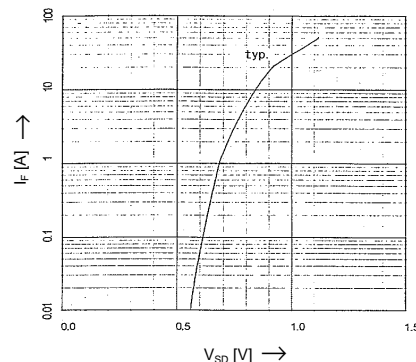
Typical Gate Charge Characteristics

$V_{GS} = f(Q_g); I_D = 20A$



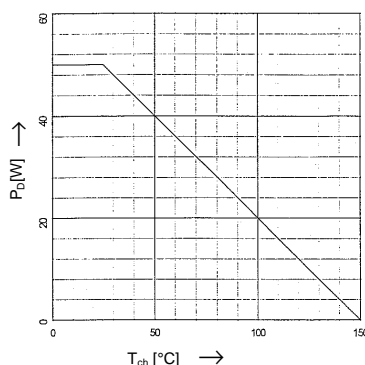
Forward Characteristics of Reverse Diode

$I_F = f(V_{SD}); 80\mu s$  pulse test



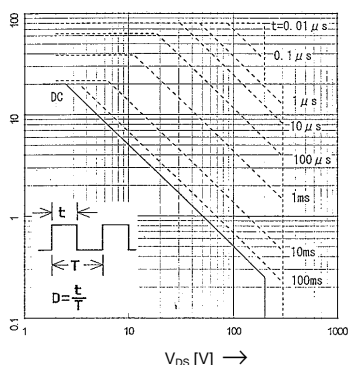
Power Dissipation

$P_D = f(T_C)$



Safe Operation Area

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



Transient Thermal Impedance

Transient Thermal Impedance

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

