

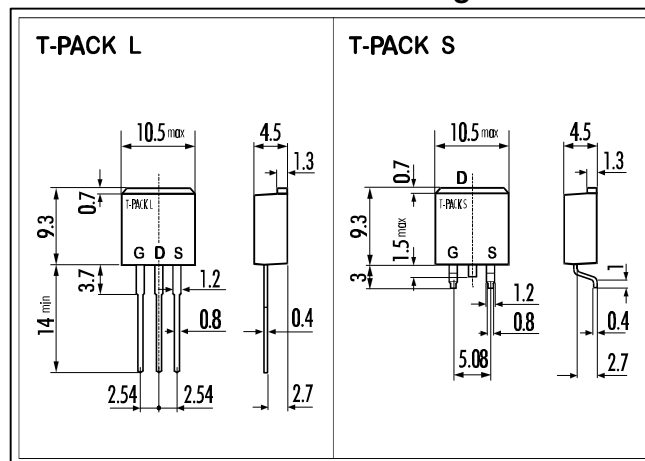
### > Features

- 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



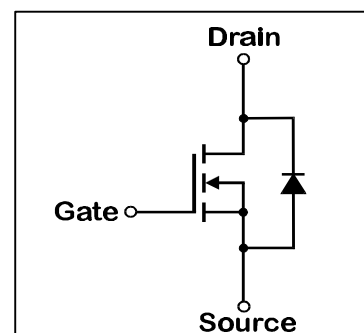
### > Maximum Ratings and Characteristics

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

| Item                                    | Symbol        | Rating     | Unit             |
|-----------------------------------------|---------------|------------|------------------|
| Drain-Source-Voltage                    | $V_{DS}$      | 30         | V                |
| Continuous Drain Current                | $I_D$         | ±35        | A                |
| Pulsed Drain Current                    | $I_{D(puls)}$ | ±140       | A                |
| Gate-Source-Voltage                     | $V_{GS}$      | ±16        | V                |
| Max. Avalanche Energy                   | $E_{AV}$      | 129.3      | mJ               |
| Max. Power Dissipation                  | $P_D$         | 30         | W                |
| Operating and Storage Temperature Range | $T_{ch}$      | 150        | $^\circ\text{C}$ |
|                                         | $T_{stg}$     | -55 ~ +150 | $^\circ\text{C}$ |

$L=0.070\text{mH}$ ,  $V_{CC}=12V$

### > Equivalent Circuit



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

| Item                                                 | Symbol       | Test conditions                                       | Min. | Typ. | Max. | Unit          |
|------------------------------------------------------|--------------|-------------------------------------------------------|------|------|------|---------------|
| Drain-Source Breakdown-Voltage                       | $BV_{DSS}$   | $I_D=1\text{mA}$ $V_{GS}=0V$                          | 30   |      |      | V             |
| Gate Threshold Voltage                               | $V_{GS(th)}$ | $I_D=1\text{mA}$ $V_{DS}=V_{GS}$                      | 1,0  | 1,5  | 2,0  | V             |
| Zero Gate Voltage Drain Current                      | $I_{DSS}$    | $V_{DS}=30V$ $T_{ch}=25^\circ\text{C}$                |      | 10   | 500  | $\mu\text{A}$ |
|                                                      |              | $V_{GS}=0V$ $T_{ch}=125^\circ\text{C}$                |      | 0,2  | 1,0  | mA            |
| Gate Source Leakage Current                          | $I_{GSS}$    | $V_{GS}=\pm 16V$ $V_{DS}=0V$                          |      | 10   | 100  | nA            |
| Drain Source On-State Resistance                     | $R_{DS(on)}$ | $I_D=17,5A$ $V_{GS}=4V$                               |      | 22   | 30   | mΩ            |
|                                                      |              | $V_{GS}=10V$                                          |      | 14   | 20   | mΩ            |
| Forward Transconductance                             | $g_{fs}$     | $I_D=17,5A$ $V_{DS}=25V$                              | 16   | 33   |      | S             |
| Input Capacitance                                    | $C_{iss}$    | $V_{DS}=25V$                                          |      | 1100 | 1650 | pF            |
| Output Capacitance                                   | $C_{oss}$    | $V_{GS}=0V$                                           |      | 550  | 830  | pF            |
| Reverse Transfer Capacitance                         | $C_{rss}$    | $f=1\text{MHz}$                                       |      | 240  | 360  | pF            |
| Turn-On-Time $t_{on}$ ( $t_{on}=t_{d(on)}+t_r$ )     | $t_{d(on)}$  | $V_{CC}=15V$                                          |      | 9    | 15   | ns            |
|                                                      | $t_r$        | $I_D=35A$                                             |      | 75   | 115  | ns            |
| Turn-Off-Time $t_{off}$ ( $t_{off}=t_{d(off)}+t_f$ ) | $t_{d(off)}$ | $V_{GS}=10V$                                          |      | 15   | 23   | ns            |
|                                                      | $t_f$        | $R_{GS}=10\Omega$                                     |      | 50   | 75   | ns            |
| Avalanche Capability                                 | $I_{AV}$     | $L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$          | 35   |      |      | A             |
| Diode Forward On-Voltage                             | $V_{SD}$     | $I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ\text{C}$   |      | 0,98 | 1,71 | V             |
| Reverse Recovery Time                                | $t_{rr}$     | $I_F=2I_{DR}$ $V_{GS}=0V$                             |      | 50   |      | ns            |
| Reverse Recovery Charge                              | $Q_{rr}$     | $-dI_F/dt=100A/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$ |      | 0,08 |      | $\mu\text{C}$ |

- Thermal Characteristics

| Item               | Symbol         | Test conditions | Min. | Typ. | Max.  | Unit               |
|--------------------|----------------|-----------------|------|------|-------|--------------------|
| Thermal Resistance | $R_{th(ch-c)}$ | channel to case |      |      | 4,16  | $^\circ\text{C/W}$ |
|                    | $R_{th(ch-a)}$ | channel to air  |      |      | 125,0 | $^\circ\text{C/W}$ |

| N-channel MOS-FET |      |      |     |
|-------------------|------|------|-----|
| 30V               | 20mΩ | ±35A | 30W |

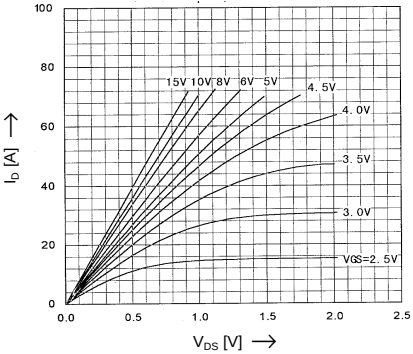
2SK2807-01L,S

FAP-IIS Series

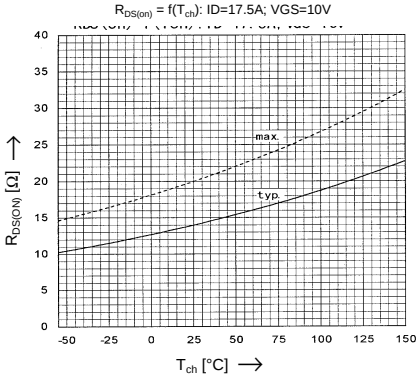


> Characteristics

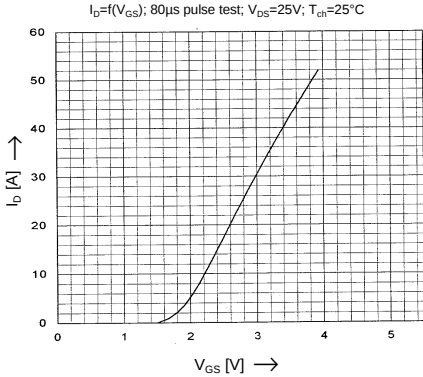
Typical Output Characteristics  
 $I_D=f(V_{DS})$ ; 80μs pulse test;  $T_C=25^{\circ}\text{C}$



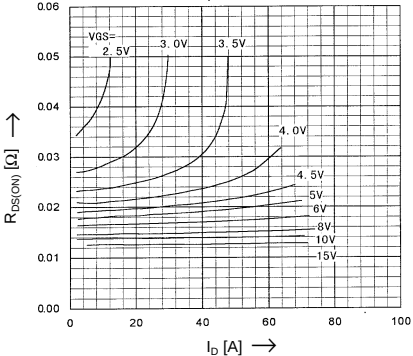
Drain-Source-On-State Resistance vs.  $T_{ch}$   
 $R_{DS(on)}=f(T_{ch})$ ;  $I_D=17.5\text{A}$ ;  $V_{GS}=10\text{V}$



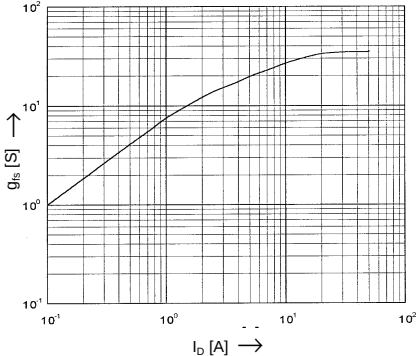
Typical Transfer Characteristics  
 $I_D=f(V_{GS})$ ; 80μs pulse test;  $V_{DS}=25\text{V}$ ;  $T_{ch}=25^{\circ}\text{C}$



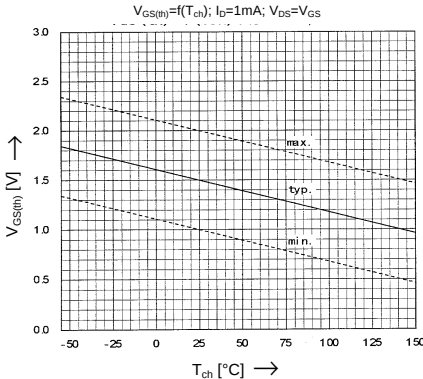
Typical Drain-Source-On-State-Resistance vs.  $I_D$   
 $R_{DS(on)}=f(I_D)$ ; 80μs pulse test;  $T_C=25^{\circ}\text{C}$



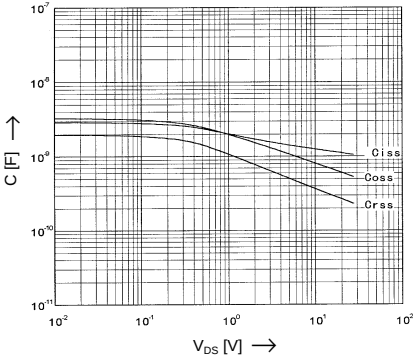
Typical Forward Transconductance vs.  $I_D$   
 $g_{fs}=f(I_D)$ ; 80μs pulse test;  $V_{DS}=25\text{V}$ ;  $T_{ch}=25^{\circ}\text{C}$



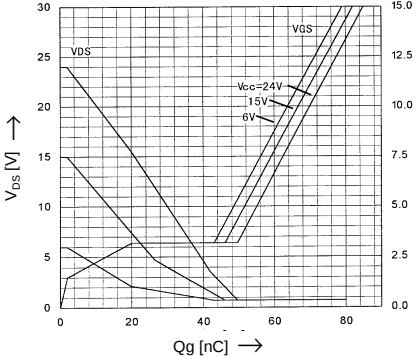
Gate Threshold Voltage vs.  $T_{ch}$   
 $V_{GS(th)}=f(T_{ch})$ ;  $I_D=1\text{mA}$ ;  $V_{DS}=V_{GS}$



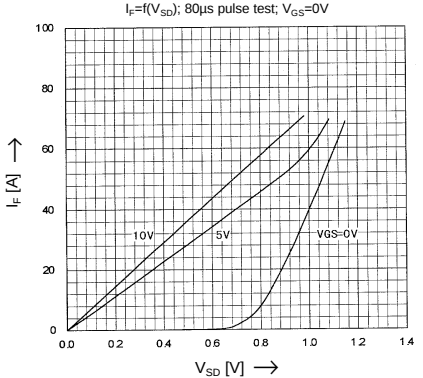
Typical Capacitances vs.  $V_{DS}$   
 $C=f(V_{DS})$ ;  $V_{GS}=0\text{V}$ ;  $f=1\text{MHz}$



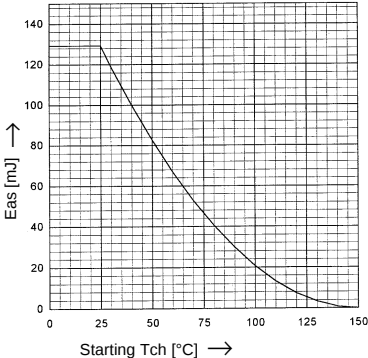
Typical Gate Charge Characteristic  
 $V_{GS}=f(Q_g)$ ;  $I_D=35\text{A}$ ;  $T_C=25^{\circ}\text{C}$



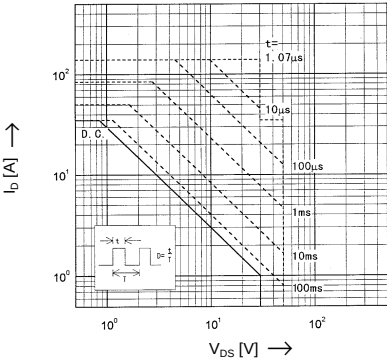
Forward Characteristics of Reverse Diode  
 $I_F=f(V_{SD})$ ; 80μs pulse test;  $V_{GS}=0\text{V}$



Avalanche Energy Derating  
 $E(AV)as=f(\text{starting } T_{ch})$ ;  $V_{CC}=12\text{V}$ ;  $I_{AVC}=35\text{A}$

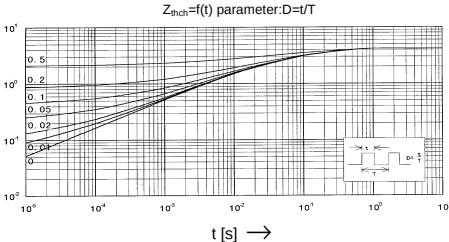


Safe operation area  
 $I_D=f(V_{DS})$ ;  $D=0.01$ ;  $T_C=25^{\circ}\text{C}$



$Z_{th(ch-e)}$  [K/W] ↑

Transient Thermal impedance  
 $Z_{th(ch)}=f(t)$  parameter:  $D=t/T$



| N-channel MOS-FET |      |      |     |
|-------------------|------|------|-----|
| 30V               | 20mΩ | ±35A | 30W |

2SK2807-01L,S

FAP-IIS Series



> Characteristics

