

**Features:**

- Advanced trench process technology
- avalanche energy, 100% test
- Fully characterized avalanche voltage and current

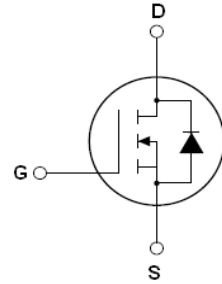
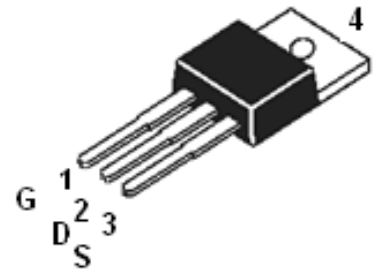
**Description:**

The SSF6807 is a new generation of high voltage and low current N-Channel enhancement mode trench power MOSFET. This new technology increases the device reliability and electrical parameter repeatability. SSF6807 is assembled in high reliability and qualified assembly house.

**Application:**

- Power switching application

**ID =84A**  
**BV=60V**  
**Rdson=0.008Ω**


**SSF6807 TOP View (T0-220)**

**Absolute Maximum Ratings**

|                        | Parameter  | Max.        | Units |
|------------------------|--|-------------|-------|
| $I_D@T_c=25\text{ C}$  | Continuous drain current, $V_{GS}@10V$           | 84          | A     |
| $I_D@T_c=100\text{ C}$ | Continuous drain current, $V_{GS}@10V$           | 76          |       |
| $I_{DM}$               | Pulsed drain current ①                           | 310         |       |
| $P_D@T_c=25\text{ C}$  | Power dissipation                                | 150         | W     |
|                        | Linear derating factor                           | 1.5         | W/ C  |
| $V_{GS}$               | Gate-to-Source voltage                           | $\pm 20$    | V     |
| $E_{AS}$               | Single pulse avalanche energy ②                  | 400         | mJ    |
| $E_{AR}$               | Repetitive avalanche energy                      | TBD         | mJ    |
| dv/dt                  | Peak diode recovery voltage                      | 31          | v/ns  |
| $T_J$<br>$T_{STG}$     | Operating Junction and Storage Temperature Range | -55 to +150 | °C    |

**Thermal Resistance**

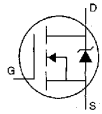
|                 | Parameter           | Min. | Typ. | Max. | Units |
|-----------------|---------------------|------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-case    | —    | 0.83 | —    | °C/W  |
| $R_{\theta JA}$ | Junction-to-ambient | —    | —    | 62   |       |

**Electrical Characteristics @ $T_J=25\text{ C}$ (unless otherwise specified)**

|              | Parameter                            | Min. | Typ.   | Max.  | Units | Test Conditions                           |
|--------------|--------------------------------------|------|--------|-------|-------|---|
| $BV_{DSS}$   | Drain-to-Source breakdown voltage    | 60   | —      | —     | V     | $V_{GS}=0V, I_D=250\mu A$                 |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | —    | 0.0057 | 0.008 | Ω     | $V_{GS}=10V, I_D=30A$                     |
| $V_{GS(th)}$ | Gate threshold voltage               | 2.0  | —      | 4.0   | V     | $V_{DS}=V_{GS}, I_D=250\mu A$             |
| $I_{DSS}$    | Drain-to-Source leakage current      | —    | —      | 2     | μA    | $V_{DS}=60V, V_{GS}=0V$                   |
|              |                                      | —    | —      | 10    |       | $V_{DS}=60V, V_{GS}=0V, T_J=150\text{ C}$ |
| $I_{GSS}$    | Gate-to-Source forward leakage       | —    | —      | 100   | nA    | $V_{GS}=20V$                              |
|              | Gate-to-Source reverse leakage       | —    | —      | -100  |       | $V_{GS}=-20V$                             |

|              |                                |   |      |   |    |   |
|--------------|--------------------------------|---|------|---|----|---|
| $Q_g$        | Total gate charge              | — | 90   |   | nC | $I_D=30A, V_{GS}=10V$<br>$V_{DD}=30V$                                     |
| $Q_{gs}$     | Gate-to-Source charge          | — | 18   | — |    |   |
| $Q_{gd}$     | Gate-to-Drain("Miller") charge | — | 28   | — |    |   |
| $t_{d(on)}$  | Turn-on delay time             | — | 18.2 |   | nS | $V_{DD}=30V$<br>$I_D=2A, R_L=15\Omega$<br>$R_G=2.5\Omega$<br>$V_{GS}=10V$ |
| $t_r$        | Rise time                      | — | 15.6 |   |    |   |
| $t_{d(off)}$ | Turn-Off delay time            | — | 70.5 |   |    |   |
| $t_f$        | Fall time                      | — | 13.8 |   |    |   |
| $C_{iss}$    | Input capacitance              | — | 3150 |   | pF | $V_{GS}=0V$<br>$V_{DS}=25V$<br>$f=1.0MHZ$                                 |
| $C_{oss}$    | Output capacitance             | — | 300  |   |    |   |
| $C_{rss}$    | Reverse transfer capacitance   | — | 240  |   |    |   |

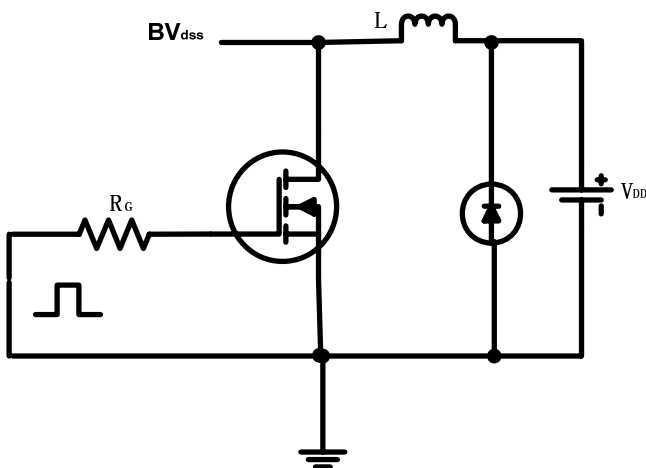
### Source-Drain Ratings and Characteristics

|          | Parameter                              | Min.  | Typ. | Max. | Units   | Test Conditions  |
|----------|--|---|------|------|---------|--|
| $I_S$    | Continuous Source Current (Body Diode) | —   | —    | 84   | A       | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ①   | —   | —    | 310  |         |  |
| $V_{SD}$ | Diode Forward Voltage                  | —   | —    | 1.3  | V       | $T_J=25C, I_S=60A, V_{GS}=0V$ ③  |
| $t_{rr}$ | Reverse Recovery Time                  | —   | 57   | —    | nS      | $T_J=25C, I_F=75A$   |
| $Q_{rr}$ | Reverse Recovery Charge                | —   | 107  | —    | $\mu C$ | $di/dt=100A/\mu s$ ③   |
| $t_{on}$ | Forward Turn-on Time                   | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$ ) |      |      |         |  |

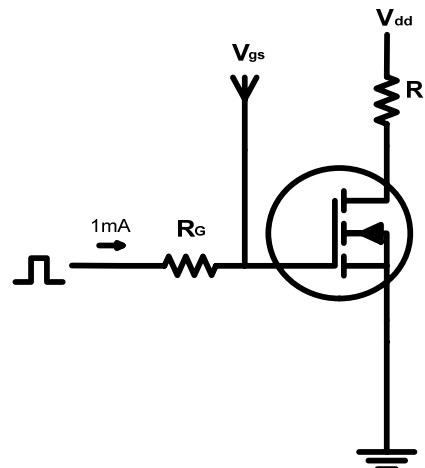
Notes:

- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Test condition:  $L = 0.3mH, V_{DD} = 30V, I_D=37A$
- ③ Pulse width  $\leq 300\mu S$ , duty cycle  $\leq 1.5\%$ ;  $R_G = 25\Omega$  Starting  $T_J = 25^\circ C$

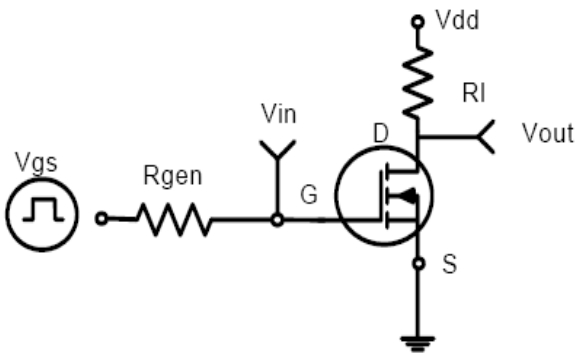
#### EAS Test Circuit:



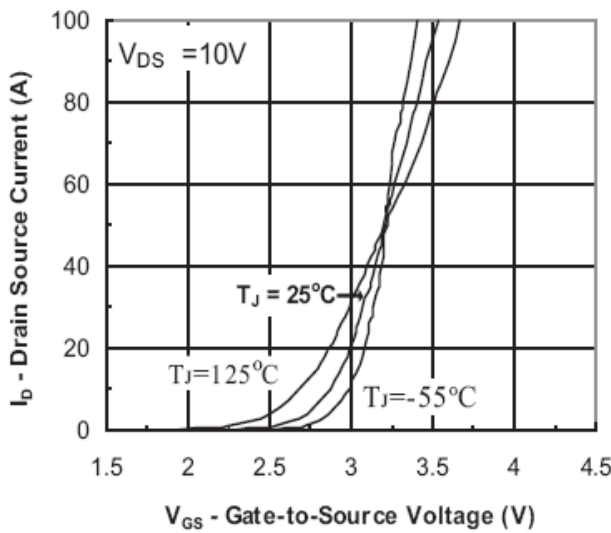
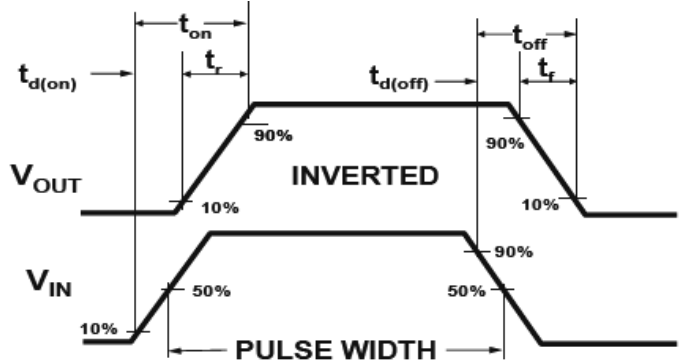
#### Gate Charge Test Circuit:



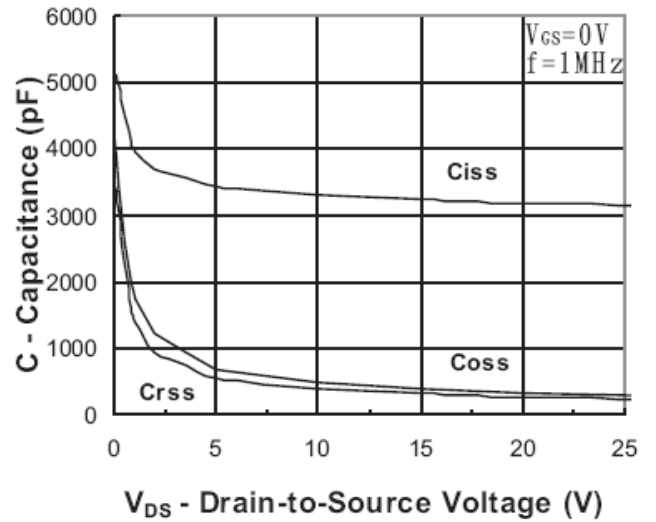
### Switch Time Test Circuit:



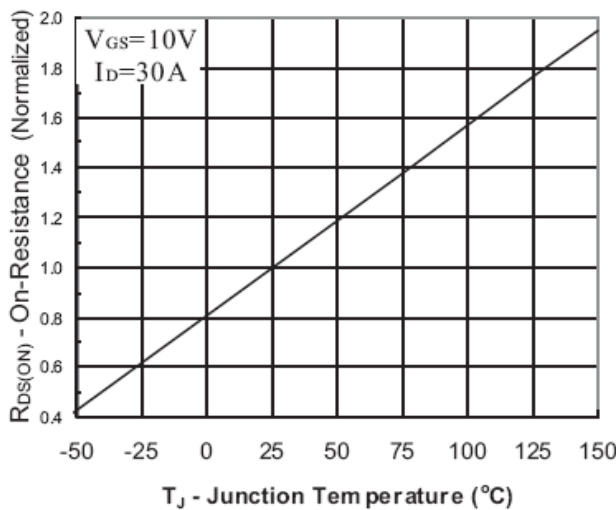
### Switch Waveform:



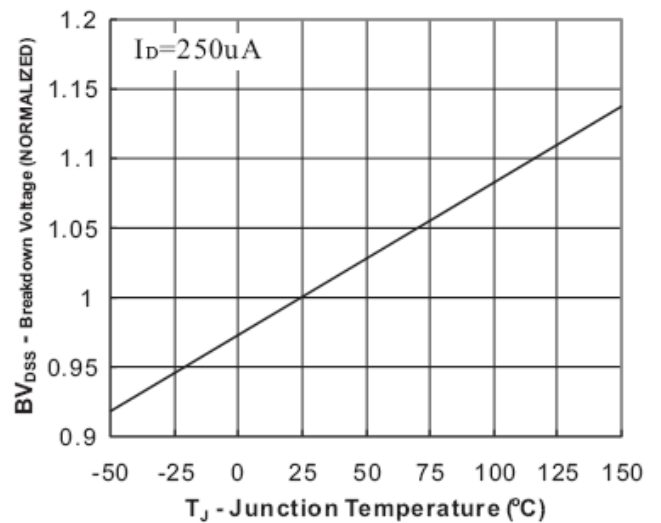
Transfer Characteristic



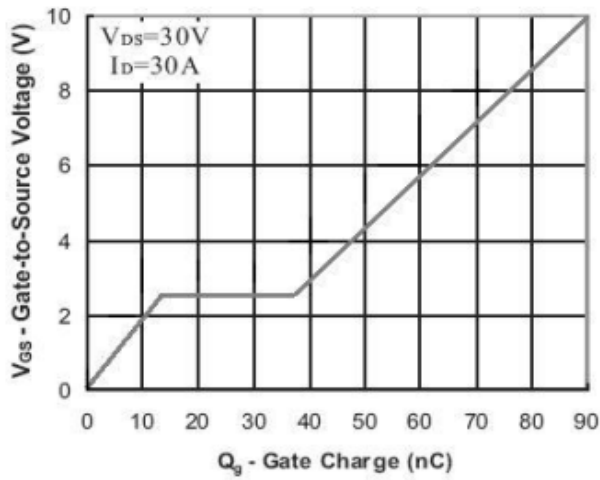
Capacitance



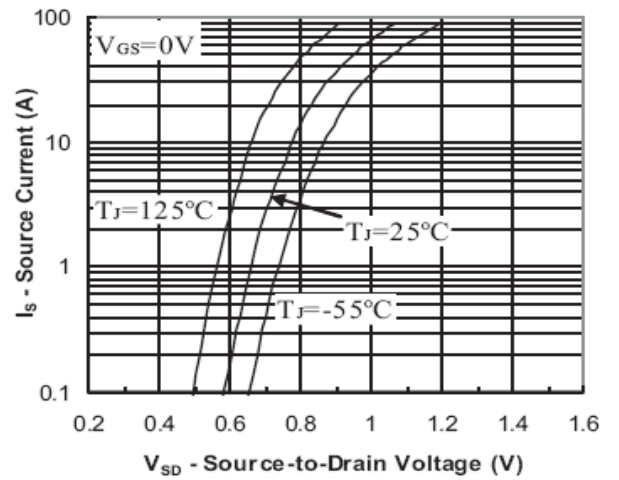
On Resistance vs Junction Temperature



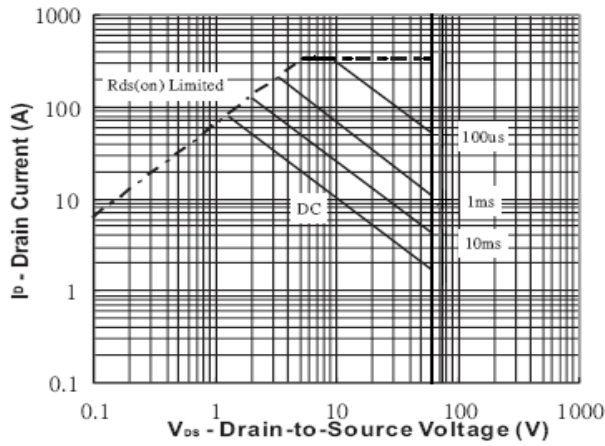
Breakdown Voltage vs Junction Temperature



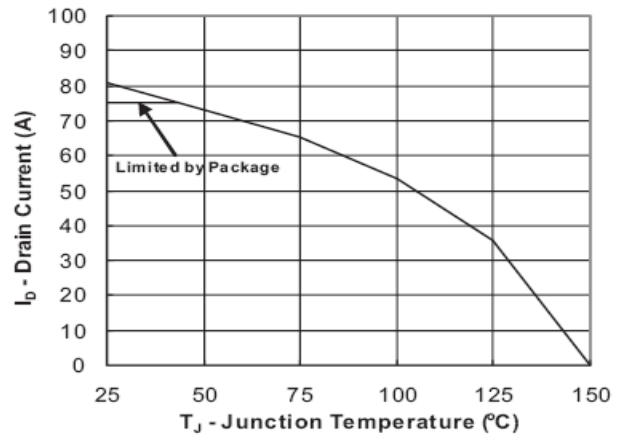
**Gate Charge**



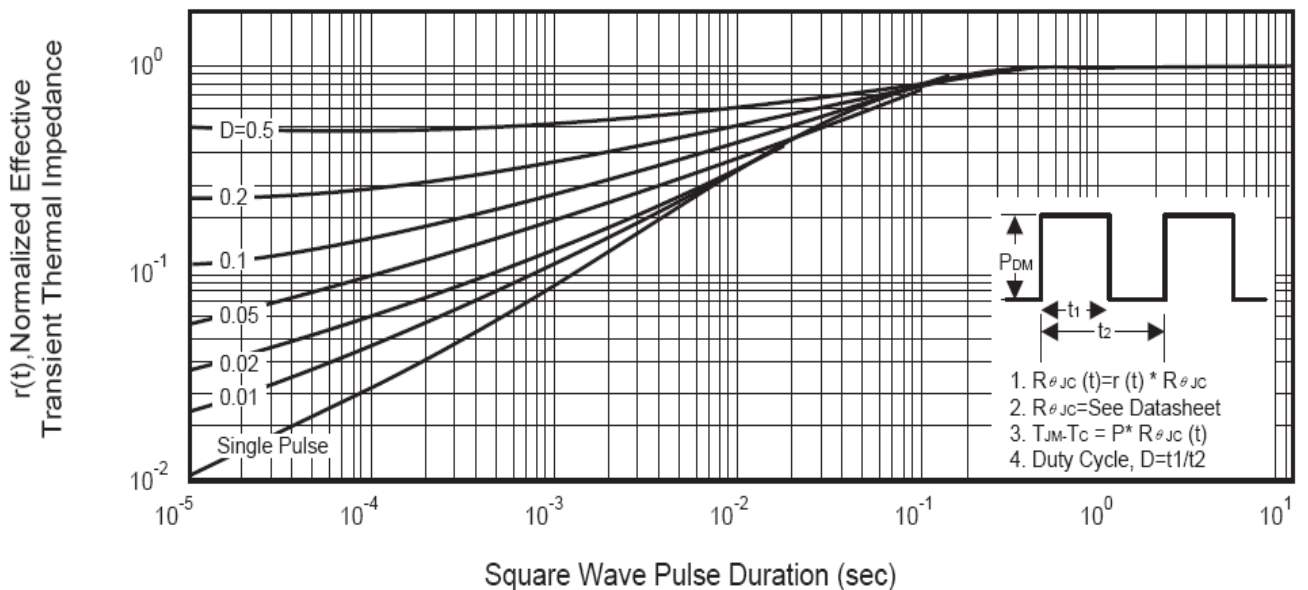
**Source-Drain Diode Forward Voltage**



**Safe Operation Area**



**Max Drain Current vs Junction**



**Transient Thermal Impedance Curve**

## TO-220 MECHANICAL DATA:

