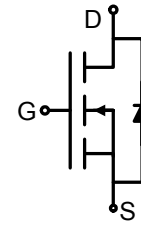
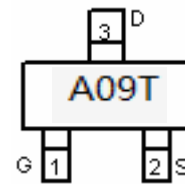


- $V_{DS} = 30V, I_D = 5.8A$   
 $R_{DS(ON)} < 59m\Omega @ V_{GS}=2.5V$   
 $R_{DS(ON)} < 45m\Omega @ V_{GS}=4.5V$   
 $R_{DS(ON)} < 41m\Omega @ V_{GS}=10V$



Schematic diagram



Marking and pin assignment



SOT-23 top view

### Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

| Parameter  | Symbol         | Limit      | Unit       |
|--|----------------|------------|------------|
| Drain-Source Voltage                             | $V_{DS}$       | 30         | V          |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 12$   | V          |
| Drain Current-Continuous                         | $I_D$          | 5.8        | A          |
| Drain Current-Pulsed <sup>(Note 1)</sup>         | $I_{DM}$       | 30         | A          |
| Maximum Power Dissipation                        | $P_D$          | 1.4        | W          |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 To 150 | $^\circ C$ |

### Thermal Characteristic

|   |                 |    |              |
|---|-----------------|----|--------------|
| Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup> | $R_{\theta JA}$ | 89 | $^\circ C/W$ |
|---|-----------------|----|--------------|

### Electrical Characteristics ( $T_A=25^\circ C$ unless otherwise noted)

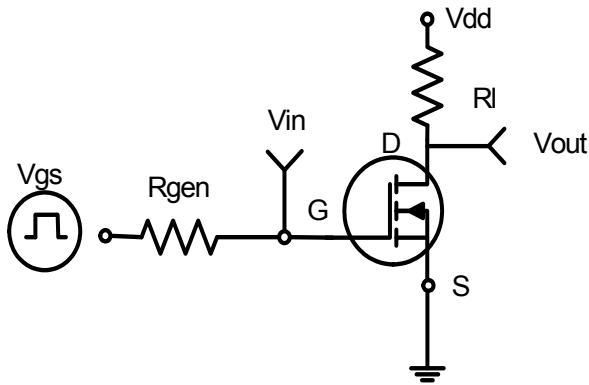
| Parameter                       | Symbol     | Condition                 | Min | Typ | Max | Unit    |
|---------------------------------|------------|---------------------------|-----|-----|-----|---------|
| <b>Off Characteristics</b>      |            |                           |     |     |     |         |
| Drain-Source Breakdown Voltage  | $BV_{DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 30  | 33  | -   | V       |
| Zero Gate Voltage Drain Current | $I_{DSS}$  | $V_{DS}=30V, V_{GS}=0V$   | -   | -   | 1   | $\mu A$ |

|  |              |  |     |     |           |            |
|--|--------------|--|-----|-----|-----------|------------|
| Gate-Body Leakage Current                            | $I_{GSS}$    | $V_{GS}=\pm 12V, V_{DS}=0V$                                  | -   | -   | $\pm 100$ | nA         |
| <b>On Characteristics</b> <sup>(Note 3)</sup>        |              |  |     |     |           |            |
| Gate Threshold Voltage                               | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$                                | 0.7 | 0.9 | 1.4       | V          |
| Drain-Source On-State Resistance                     | $R_{DS(on)}$ | $V_{GS}=2.5V, I_D=4A$  | -   | 45  | 59        | m $\Omega$ |
|  |              | $V_{GS}=4.5V, I_D=5A$  | -   | 31  | 45        | m $\Omega$ |
|  |              | $V_{GS}=10V, I_D=5.8A$                                       | -   | 28  | 41        | m $\Omega$ |
| Forward Transconductance                             | $g_{FS}$     | $V_{DS}=5V, I_D=5A$  | 10  | -   | -         | S          |
| <b>Dynamic Characteristics</b> <sup>(Note 4)</sup>   |              |  |     |     |           |            |
| Input Capacitance                                    | $C_{iss}$    | $V_{DS}=15V, V_{GS}=0V,$<br>$F=1.0MHz$                       | -   | 820 | -         | PF         |
| Output Capacitance                                   | $C_{oss}$    |  | -   | 99  | -         | PF         |
| Reverse Transfer Capacitance                         | $C_{rss}$    |  | -   | 77  | -         | PF         |
| <b>Switching Characteristics</b> <sup>(Note 4)</sup> |              |  |     |     |           |            |
| Turn-on Delay Time                                   | $t_{d(on)}$  | $V_{DD}=15V, R_L=2.7\Omega$<br>$V_{GS}=10V, R_{GEN}=3\Omega$ | -   | 3.3 | -         | nS         |
| Turn-on Rise Time                                    | $t_r$        |  | -   | 4.8 | -         | nS         |
| Turn-Off Delay Time                                  | $t_{d(off)}$ |  | -   | 26  | -         | nS         |
| Turn-Off Fall Time                                   | $t_f$        |  | -   | 4   | -         | nS         |
| Total Gate Charge                                    | $Q_g$        | $V_{DS}=15V, I_D=5.8A,$<br>$V_{GS}=4.5V$                     | -   | 9.5 | -         | nC         |
| Gate-Source Charge                                   | $Q_{gs}$     |  | -   | 1.5 | -         | nC         |
| Gate-Drain Charge                                    | $Q_{gd}$     |  | -   | 3   | -         | nC         |
| <b>Drain-Source Diode Characteristics</b>            |              |  |     |     |           |            |
| Diode Forward Voltage <sup>(Note 3)</sup>            | $V_{SD}$     | $V_{GS}=0V, I_S=5.8A$  | -   | -   | 1.2       | V          |
| Diode Forward Current <sup>(Note 2)</sup>            | $I_S$        |  | -   | -   | 5.8       | A          |

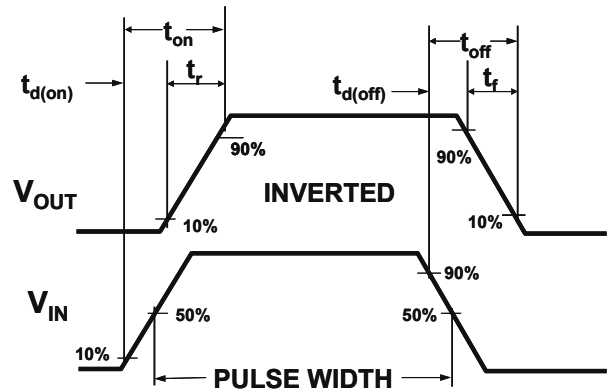
## Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

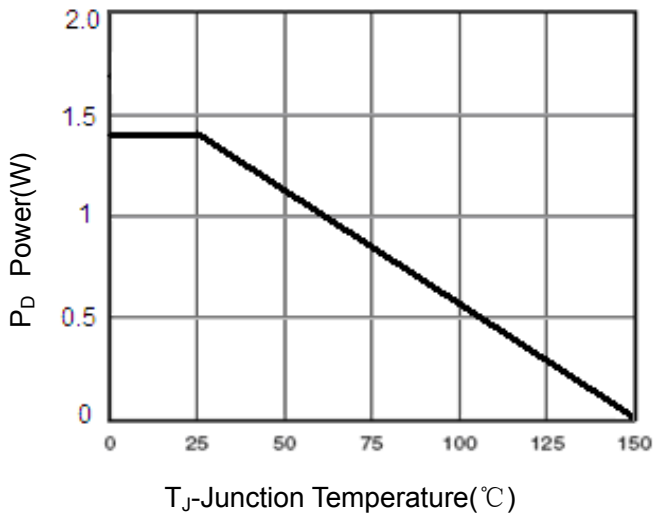
## Typical Electrical and Thermal Characteristics



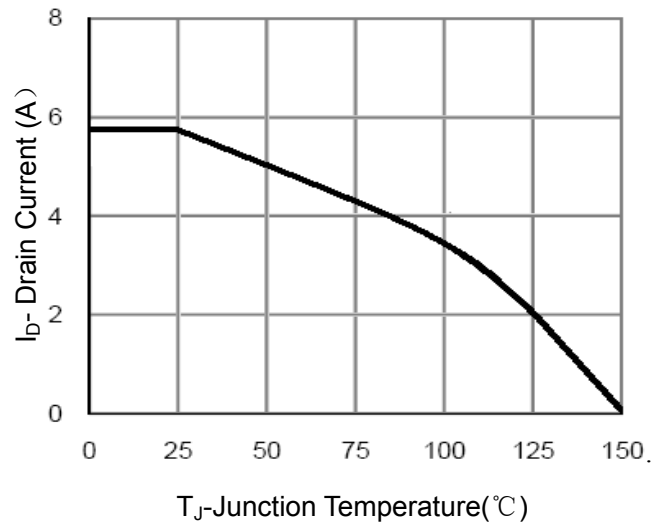
**Figure 1: Switching Test Circuit**



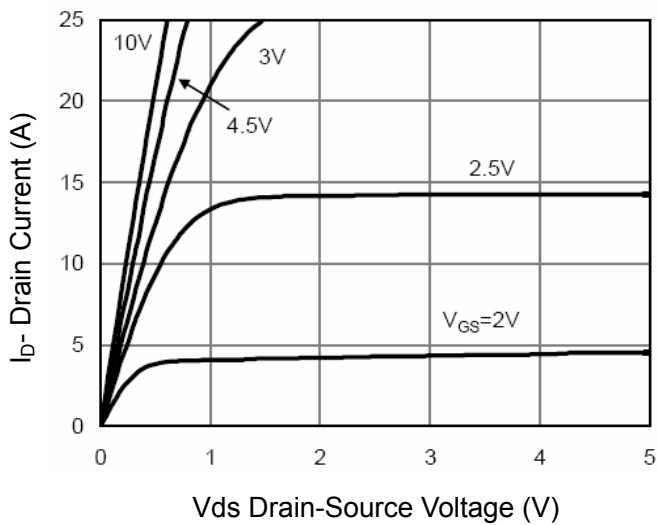
**Figure 2: Switching Waveforms**



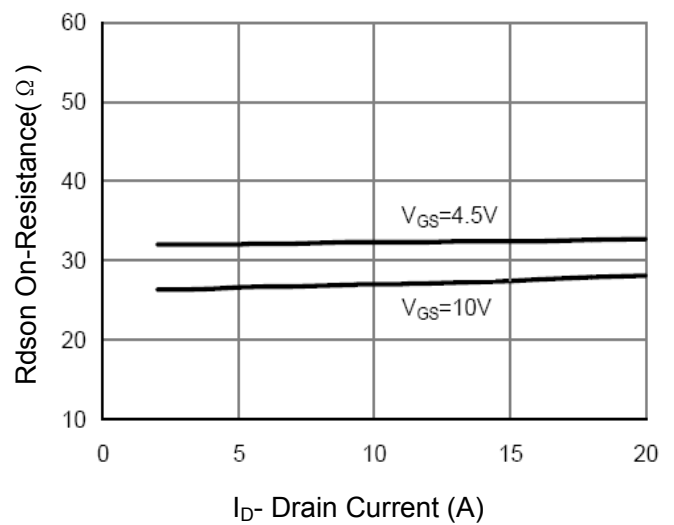
**Figure 3 Power Dissipation**



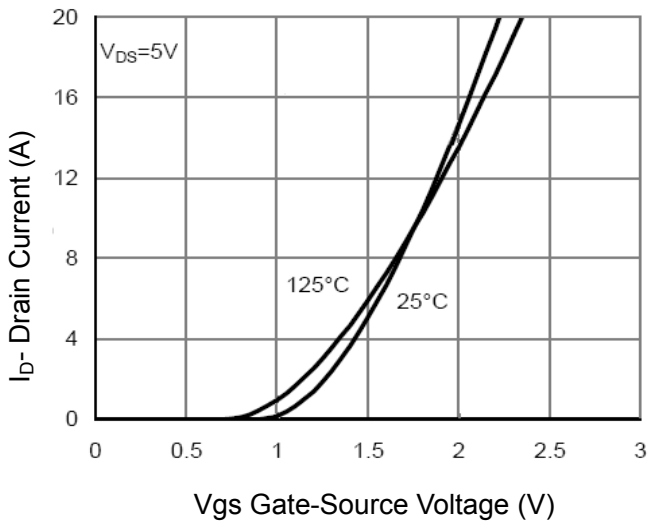
**Figure 4 Drain Current**



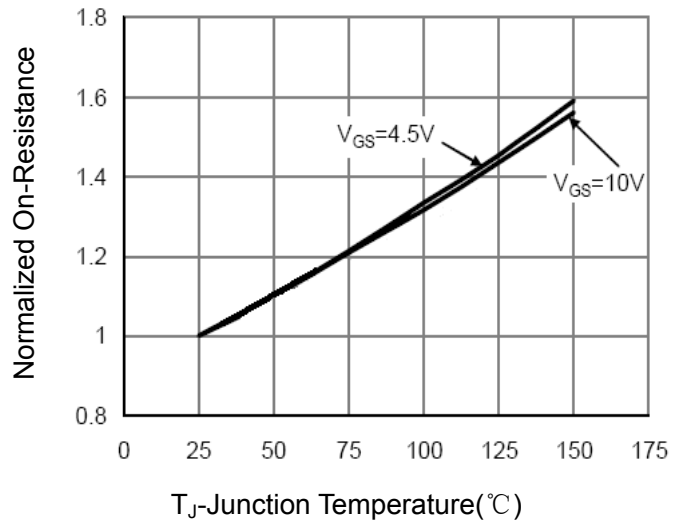
**Figure 5 Output Characteristics**



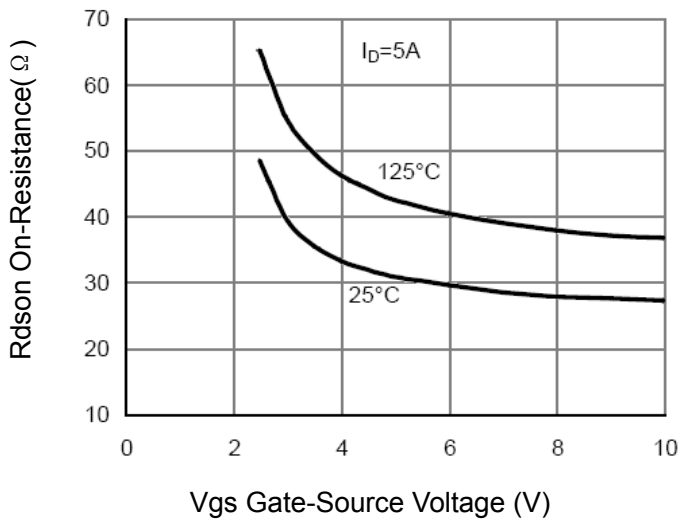
**Figure 6 Drain-Source On-Resistance**



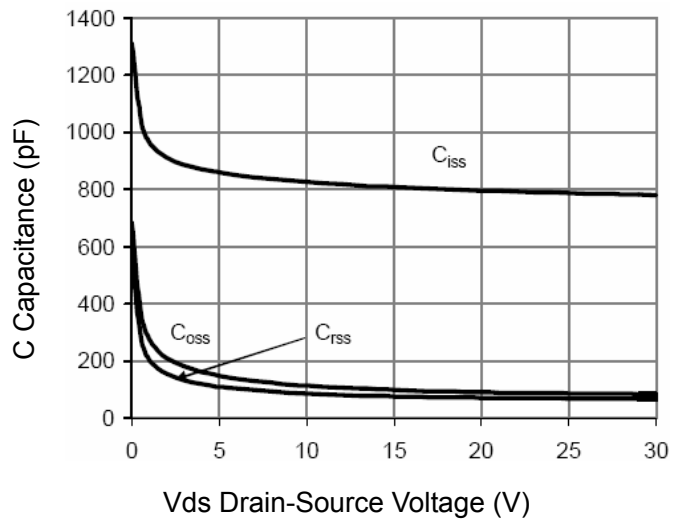
**Figure 7 Transfer Characteristics**



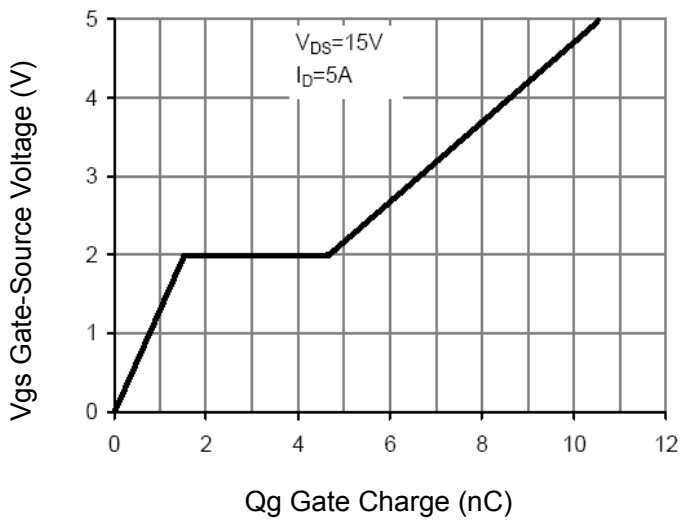
**Figure 8 Drain-Source On-Resistance**



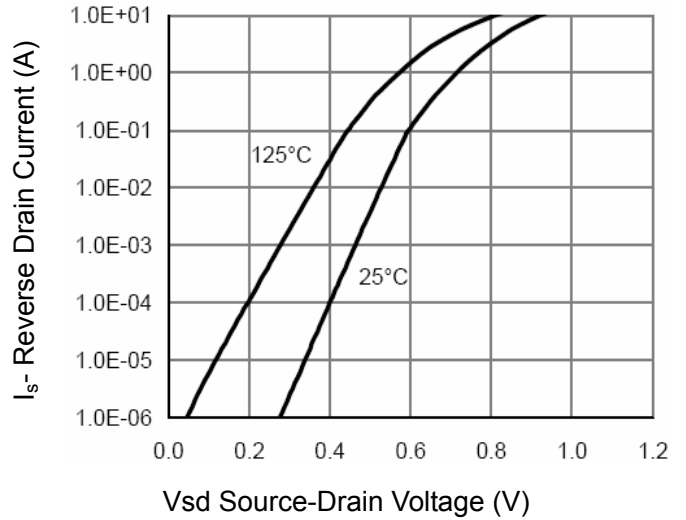
**Figure 9 Rdson vs Vgs**



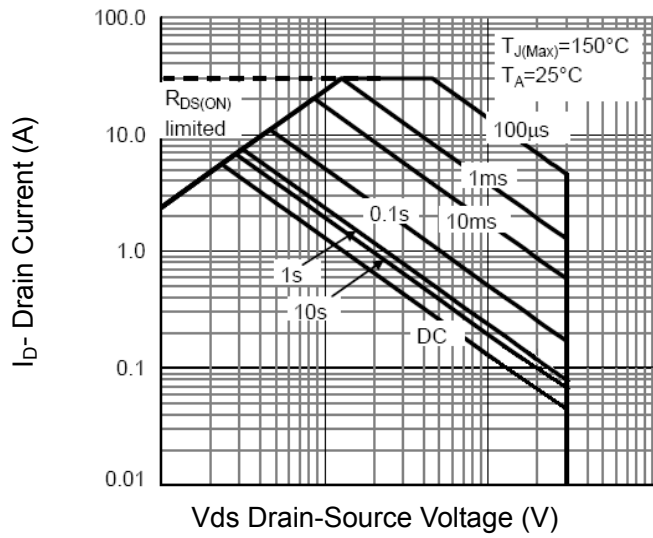
**Figure 10 Capacitance vs Vds**



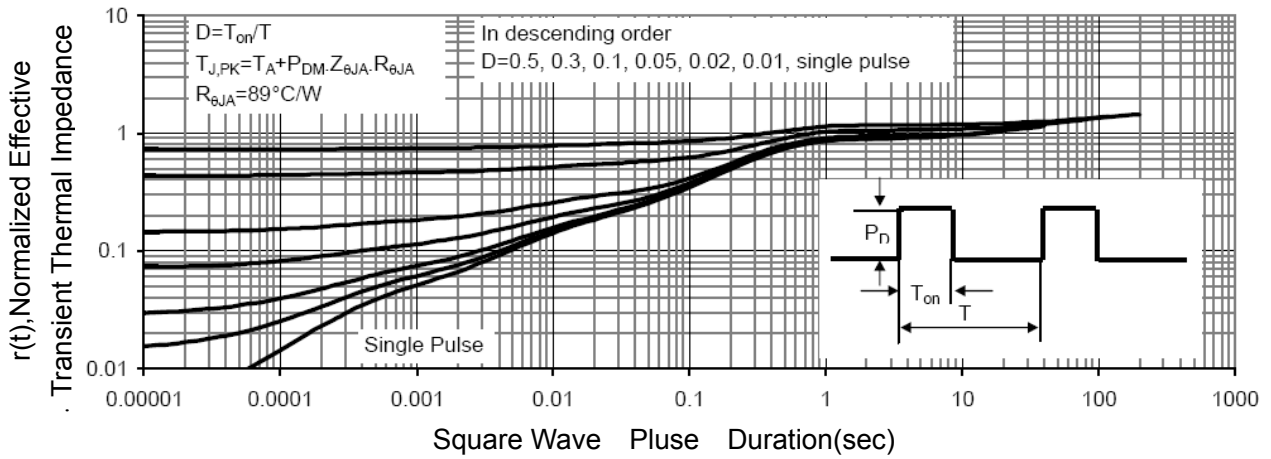
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**



**Figure 13 Safe Operation Area**



**Figure 14 Normalized Maximum Transient Thermal Impedance**