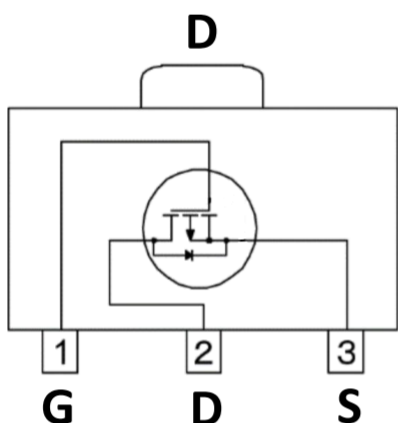


### Product Summary

- $V_{DS}$  -30 V
- $I_{DS}$  -7.0A
- $R_{DS(ON)}$  (@  $V_{GS}=-10V$ ) <40m $\Omega$

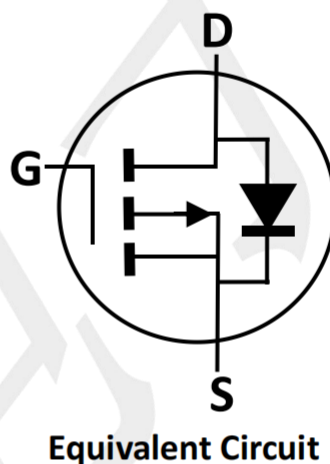
### Package and Pin Configuration



### Application

- PWM applications
- Load switch
- Power management

### Circuit diagram



### Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER                            | SYMBOL     | LIMIT       | UNIT |
|--------------------------------------|------------|-------------|------|
| Drain-Source Voltage                 | $V_{DS}$   | -30         | V    |
| Gate-Source Voltage                  | $V_{GS}$   | ±20         | V    |
| Continuous Drain Current             | $I_D$      | -7          | A    |
| Pulsed Drain Current                 | $I_{DM}$   | -21         | A    |
| Total Power Dissipation              | $P_{DTOT}$ | 1.5         | W    |
| Operating Junction Temperature Range | $T_J$      | -55 to +150 | °C   |
| Storage Temperature Range            | $T_{stg}$  | -55 to +150 | °C   |

Note : When mounted on 1" square PCB (FR4 material).

### Thermal Characteristic

| PARAMETER                              | Symbol     | Value | Unit |
|----------------------------------------|------------|-------|------|
| Junction-to-Ambient Thermal Resistance | $R_{thJA}$ | 83    | °C/W |

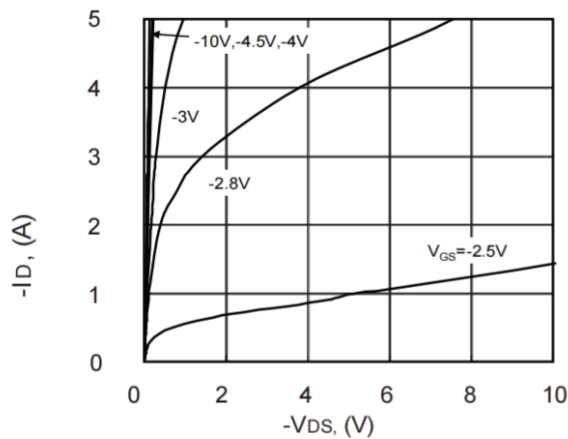
### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER                                               | CONDITIONS                                                               | SYMBOL       | MIN  | TYP  | MAX       | UNIT       |
|---------------------------------------------------------|--------------------------------------------------------------------------|--------------|------|------|-----------|------------|
| Static                                                  |                                                                          |              |      |      |           |            |
| Drain-Source Breakdown Voltage                          | $V_{GS}=0V, I_D=-250\mu A$                                               | $BV_{DSS}$   | -30  | --   | --        | V          |
| Gate-Source Threshold Voltage                           | $V_{DS}=V_{GS}, I_D=-250\mu A$                                           | $V_{GS(th)}$ | -1.0 | -1.5 | -2.5      | V          |
| Gate-Source Leakage                                     | $V_{DS}=0V, V_{GS}=\pm 20V$                                              | $I_{GSS}$    | --   | --   | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                         | $V_{DS}=-24V, V_{GS}=0V$                                                 | $I_{DSS}$    | --   | --   | -1        | $\mu A$    |
| Drain-Source On-State Resistance (Note 1)               | $V_{GS}=-10V, I_D=-7A$                                                   | $R_{DS(on)}$ | --   | 27   | 35        | m $\Omega$ |
|                                                         | $V_{GS}=-4.5V, I_D=-4A$                                                  |              | --   | 37   | 40        |            |
| Forward Transconductance (Note 2)                       | $V_{DS}=-5V, I_D=-4.6A$                                                  | $g_{fs}$     | --   | 10   | --        | S          |
| Dynamic (Note 2)                                        |                                                                          |              |      |      |           |            |
| Total Gate Charge (Note 3)                              | $V_{DS}=-15V,$<br>$I_D=-5A,$<br>$V_{GS}=-5V$                             | $Q_g$        | --   | 13   | --        | nC         |
| Gate-Source Charge (Note 3)                             |                                                                          | $Q_{gs}$     | --   | 3.5  | --        |            |
| Gate-Drain Charge (Note 3)                              |                                                                          | $Q_{gd}$     | --   | 4.5  | --        |            |
| Input Capacitance                                       | $V_{DS}=-55V, V_{GS}=0V,$<br>$F=1.0MHz$                                  | $C_{iss}$    | --   | 950  | --        | pF         |
| Output Capacitance                                      |                                                                          | $C_{oss}$    | --   | 100  | --        |            |
| Reverse Transfer Capacitance                            |                                                                          | $C_{rss}$    | --   | 95   | --        |            |
| Switching                                               |                                                                          |              |      |      |           |            |
| Turn-On Delay Time (Note 3)                             | $V_{DD}=-15V,$<br>$R_L=6\Omega,$<br>$V_{GS}=-10V,$<br>$R_{GEN}=10\Omega$ | $t_{d(on)}$  | --   | 10   | --        | nS         |
| Rise Time (Note 3)                                      |                                                                          | $t_r$        | --   | 15   | --        |            |
| Turn-Off Delay Time (Note 3)                            |                                                                          | $t_{d(off)}$ | --   | 90   | --        |            |
| Fall Time (Note 3)                                      |                                                                          | $t_f$        | --   | 50   | --        |            |
| Source-Drain Diode Ratings and Characteristics (Note 2) |                                                                          |              |      |      |           |            |
| Forward Voltage                                         | $V_{GS}=0V, I_F=-4.6A$                                                   | $V_{SD}$     | --   | -0.8 | -1.2      | V          |
| Continuous Source Current                               | Integral reverse diode in the MOSFET                                     | $I_S$        | --   | --   | -7        | A          |
| Pulsed Current (Note 1)                                 |                                                                          | $I_{SM}$     | --   | --   | -21       | A          |

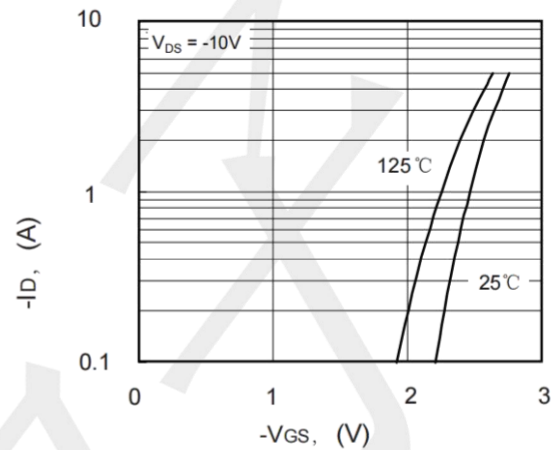
Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

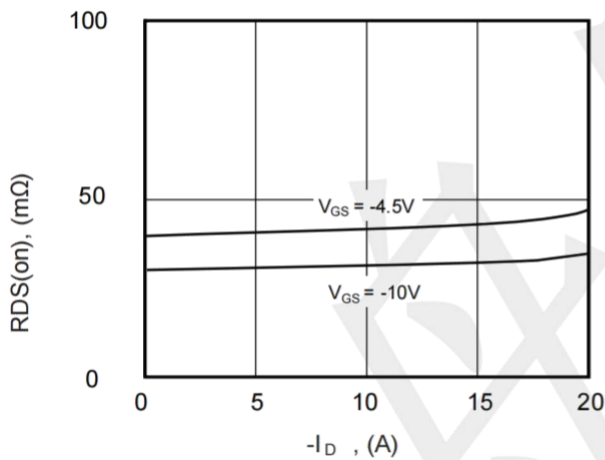
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



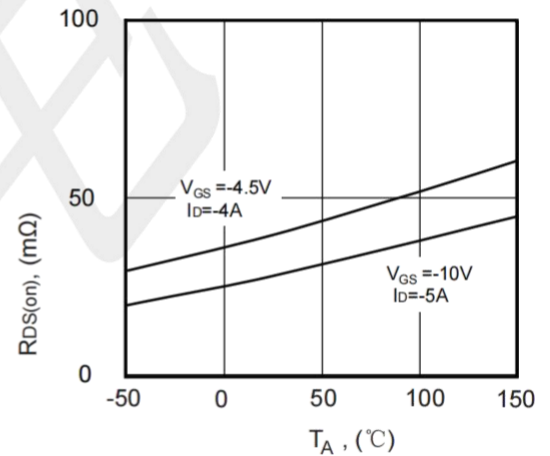
Typical Output Characteristics



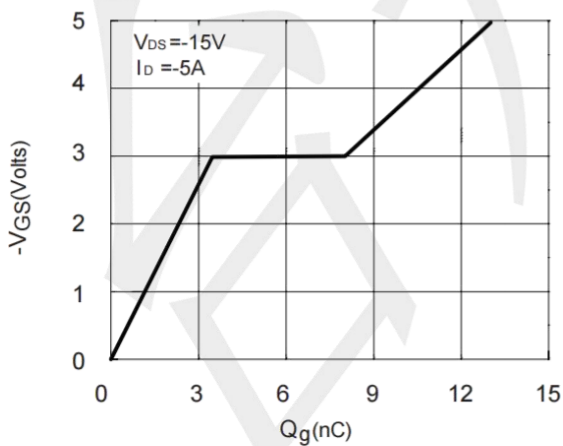
Transfer characteristics



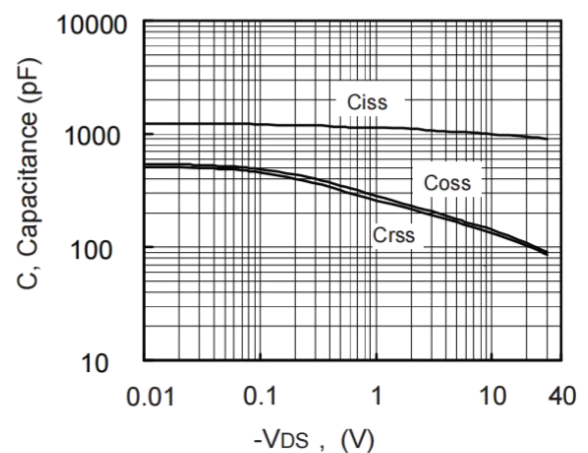
On-Resistance vs. Drain Current



On-Resistance vs. Ambient temperature



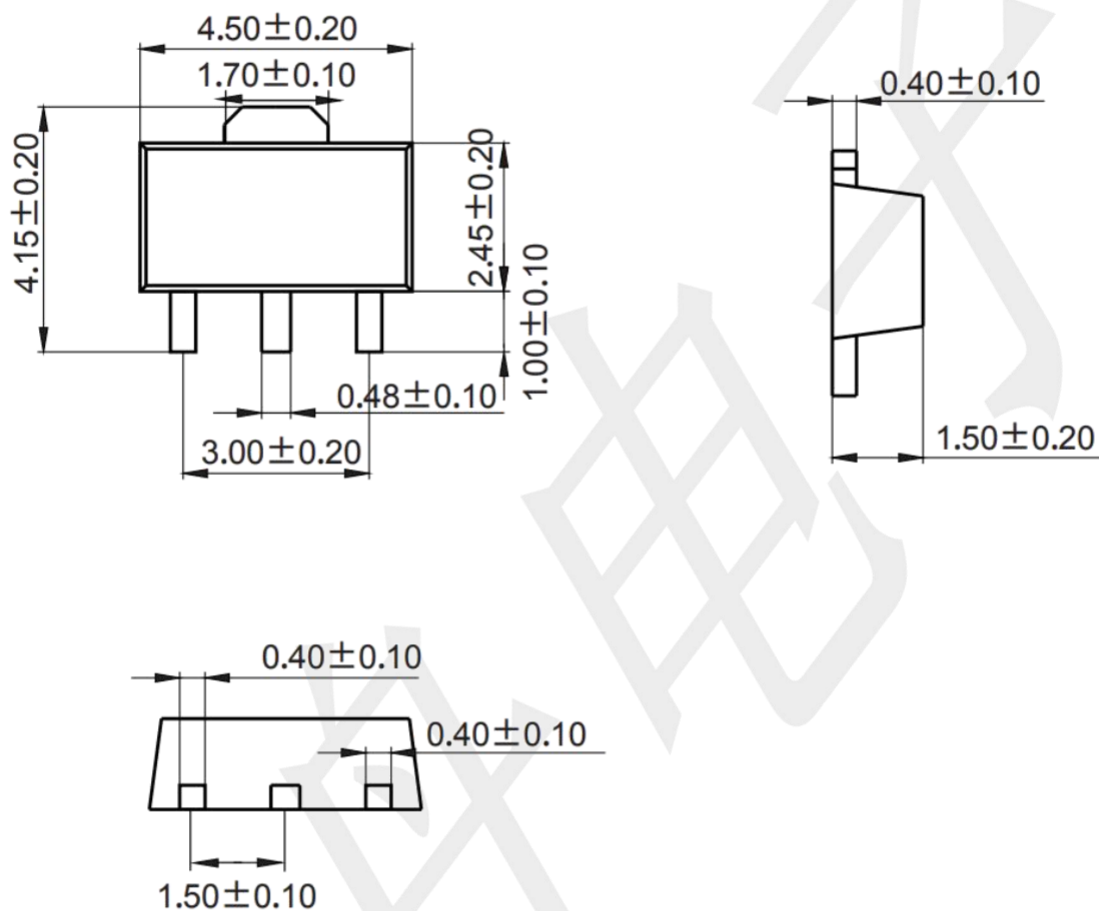
Gate Charge Characteristics



Capacitance Characteristics

**Package Information -(unit: mm)**

**SOT89-3**



**Mounting Pad Layout (unit: mm)**

