

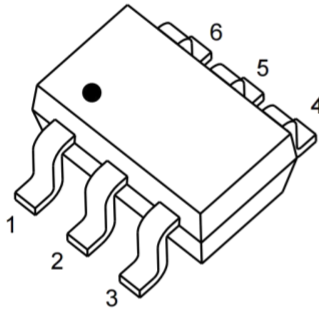
### Product Summary

- $V_{DS}$  20 V
- $I_{DS}$  1.6A
- $R_{DS(ON)}$  (at  $V_{GS}=4.5V$ )  $\leq 75m\Omega$
- $R_{DS(ON)}$  (at  $V_{GS}=2.5V$ )  $\leq 90m\Omega$

### Application

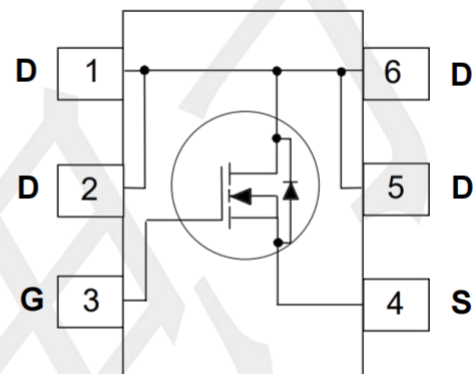
- Reverse Battery protection
- Load switch
- Power management
- Motor Control

### Package and Pin Configuration



SOT-363

### Circuit diagram



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

| PARAMETER                            | SYMBOL     | LIMIT       | UNIT        |
|--------------------------------------|------------|-------------|-------------|
| Drain-Source Voltage                 | $V_{DS}$   | 20          | V           |
| Gate-Source Voltage                  | $V_{GS}$   | $\pm 10$    | V           |
| Continuous Drain Current             | $I_D$      | 1.6         | A           |
| Drain Current-Pulsed (Note1)         | $I_{DM}$   | 6.0         | A           |
| Total Power Dissipation              | $P_{DTOT}$ | 0.42        | W           |
| Operating Junction Temperature Range | $T_J$      | -55 to +150 | $^{\circ}C$ |
| Storage Temperature Range            | $T_{stg}$  | -55 to +150 | $^{\circ}C$ |

### Thermal Characteristic

| PARAMETER                              |                      | Symbol     | Value | Unit          |
|----------------------------------------|----------------------|------------|-------|---------------|
| Junction-to-Ambient Thermal Resistance | PCB Mount<br>(Note2) | $R_{thJA}$ | 300   | $^{\circ}C/W$ |

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

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

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

| PARAMETER                                               | CONDITIONS                                                                                   | SYMBOL              | MIN  | TYP | MAX  | UNIT |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------|------|-----|------|------|
| Static                                                  |                                                                                              |                     |      |     |      |      |
| Drain-Source Breakdown Voltage                          | V <sub>GS</sub> =0V, I <sub>D</sub> = 250μA                                                  | BV <sub>DSS</sub>   | 20   | --  | --   | V    |
| Gate-Source Threshold Voltage                           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250μA                                    | V <sub>GS(th)</sub> | 0.55 | 0.7 | 1.2  | V    |
| Gate-Source Leakage                                     | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±10V                                                  | I <sub>GSS</sub>    | --   | --  | ±100 | nA   |
| Zero Gate Voltage Drain Current                         | V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V                                                   | I <sub>DSS</sub>    | --   | --  | 1    | μA   |
|                                                         | V <sub>DS</sub> = 20V, T <sub>J</sub> =125°C                                                 |                     | --   | --  | 10   | μA   |
| Drain-Source On-State Resistance (Note 1)               | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1.6A                                                | R <sub>DS(on)</sub> | --   | 65  | 75   | mΩ   |
|                                                         | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 1.0A                                                |                     | --   | 80  | 90   |      |
| Forward Transconductance (Note 2)                       | V <sub>DS</sub> = 8V, I <sub>D</sub> = 1.8A                                                  | g <sub>fs</sub>     | --   | 8   | --   | S    |
| Dynamic (Note 2)                                        |                                                                                              |                     |      |     |      |      |
| Total Gate Charge (Note 3)                              | V <sub>DS</sub> = 10V, I <sub>D</sub> = 3.6A, V <sub>GS</sub> = 4.5V                         | Q <sub>g</sub>      | --   | 4.0 | --   | nC   |
| Gate-Source Charge (Note 3)                             |                                                                                              | Q <sub>gs</sub>     | --   | 0.6 | --   |      |
| Gate-Drain Charge (Note 3)                              |                                                                                              | Q <sub>gd</sub>     | --   | 1.5 | --   |      |
| Input Capacitance                                       | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, F= 1.0MHz                                       | C <sub>iss</sub>    | --   | 300 | --   | pF   |
| Output Capacitance                                      |                                                                                              | C <sub>oss</sub>    | --   | 120 | --   |      |
| Reverse Transfer Capacitance                            |                                                                                              | C <sub>rss</sub>    | --   | 80  | --   |      |
| Switching                                               |                                                                                              |                     |      |     |      |      |
| Turn-On Delay Time (Note 3)                             | V <sub>DD</sub> = 10V, I <sub>D</sub> = 3.6A, V <sub>GS</sub> = 4.5V, R <sub>GEN</sub> = 10Ω | t <sub>d(on)</sub>  | --   | 7.0 | --   | nS   |
| Rise Time (Note 3)                                      |                                                                                              | t <sub>r</sub>      | --   | 55  | --   |      |
| Turn-Off Delay Time (Note 3)                            |                                                                                              | t <sub>d(off)</sub> | --   | 16  | --   |      |
| Fall Time (Note 3)                                      |                                                                                              | t <sub>f</sub>      | --   | 10  | --   |      |
| Source-Drain Diode Ratings and Characteristics (Note 2) |                                                                                              |                     |      |     |      |      |
| Forward Voltage                                         | V <sub>GS</sub> = 0V, I <sub>F</sub> = 1.0A                                                  | V <sub>SD</sub>     | --   | 0.8 | 1.2  | V    |

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

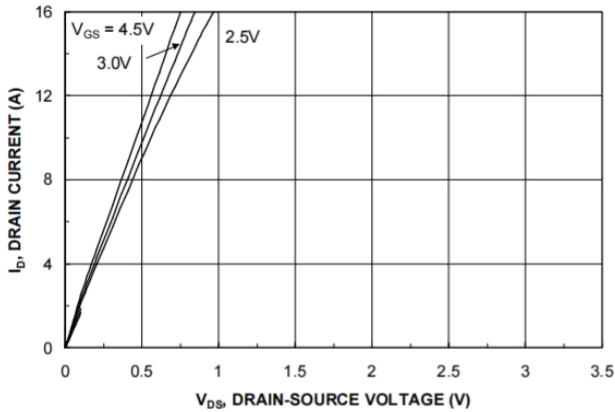


Figure 1. On-Region Characteristics.

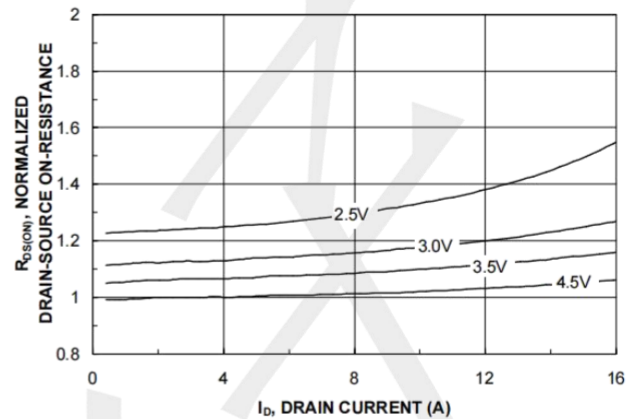


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

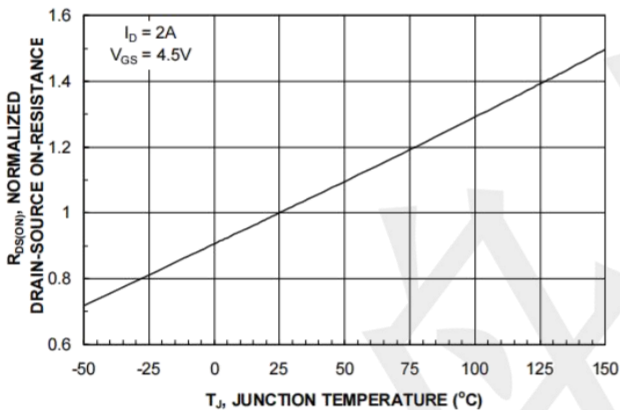


Figure 3. On-Resistance Variation with Temperature.

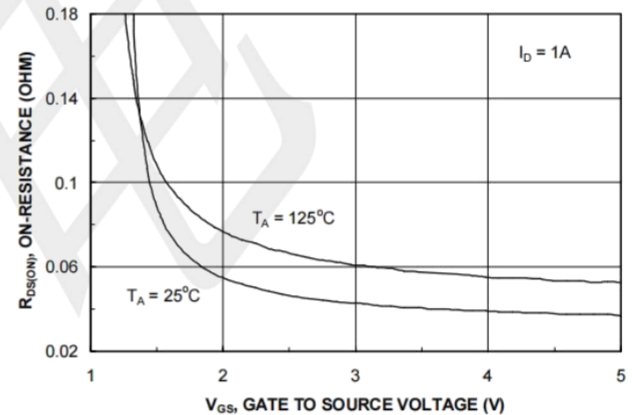


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

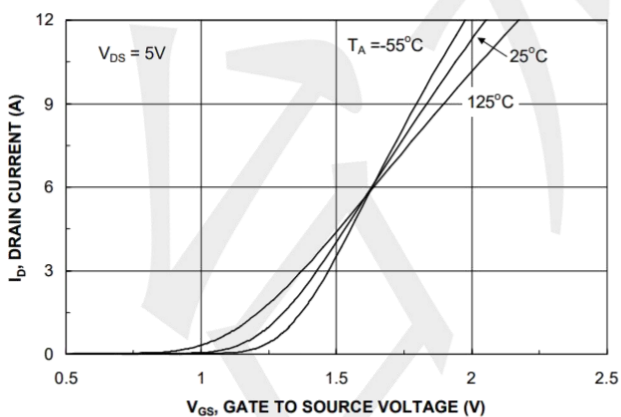


Figure 5. Transfer Characteristics.

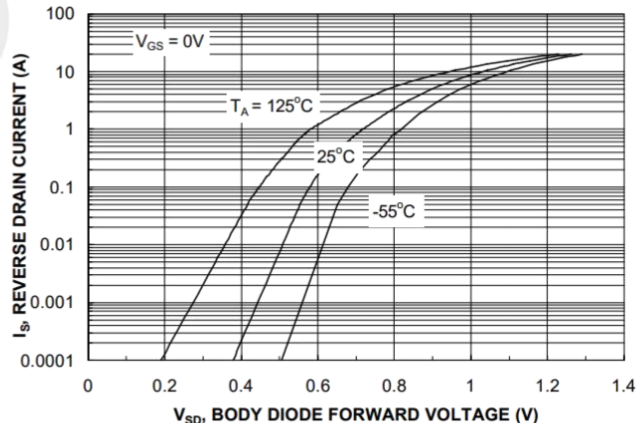
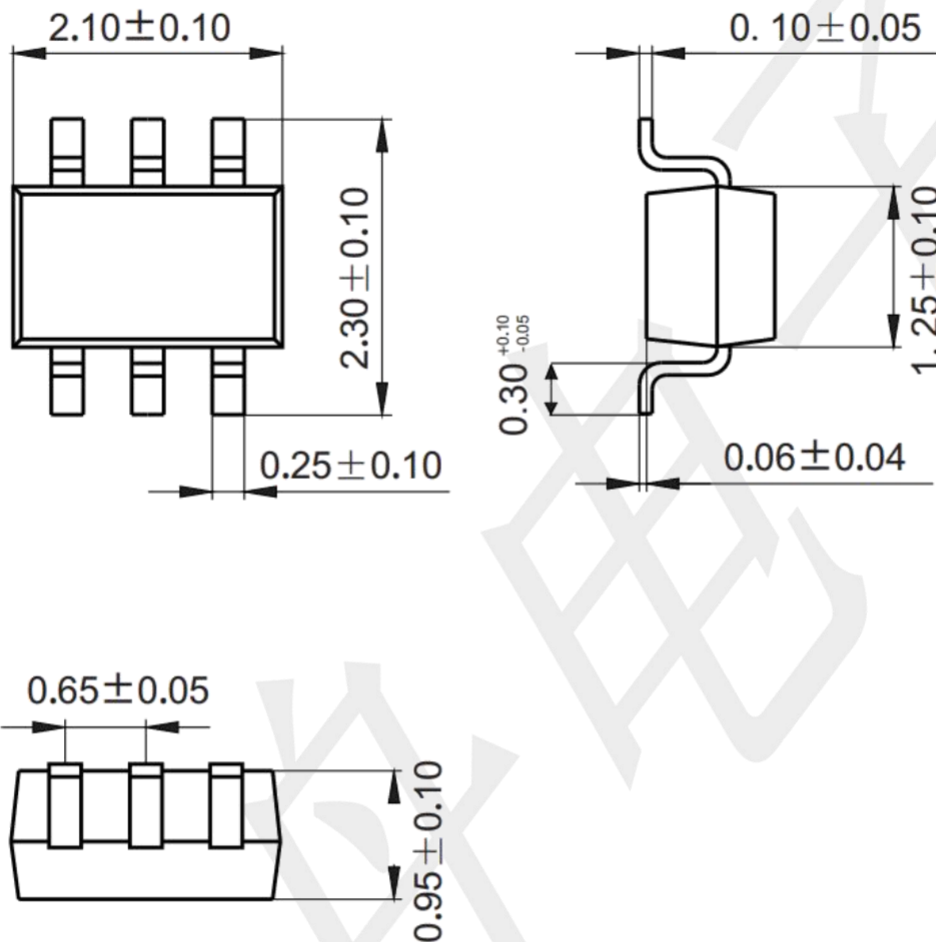


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

**Package information (Unit: mm)**

SOT363



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

