

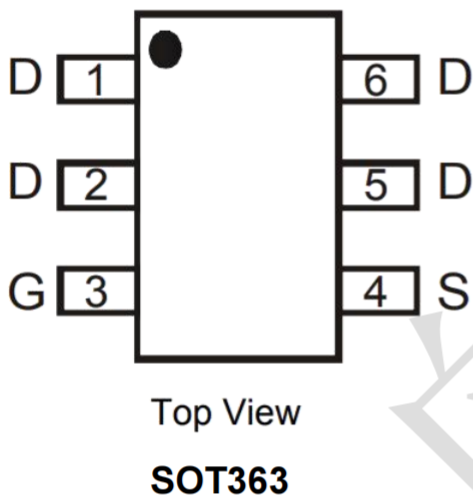
### Product Summary

- $V_{DS}$  -20 V
- $I_{DS}$  (at  $V_{GS}=-4.5V$ ) -3 A
- $R_{DS(ON)}$  (at  $V_{GS}=-4.5V$ )  $\leq 95m\Omega$

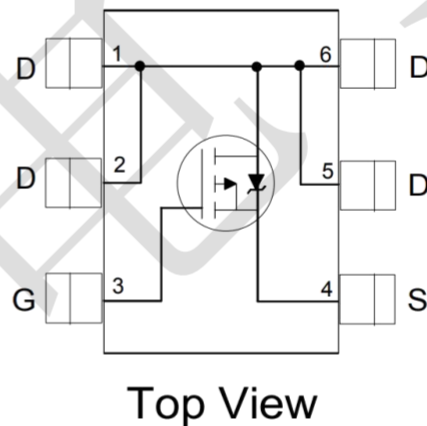
### Application

- Interfacing Switching
- Portable equipment and battery
- Load Switch

### Package and Pin Configuration



### 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                    | $I_D$     | -3          | A           |
| Pulsed Drain Current ( $t = 100 \mu s$ )    | $I_{DM}$  | -7          | A           |
| Maximum Power Dissipation $T_A=25^{\circ}C$ | $P_D$     | 1.5         | 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          |
|-------------------------------------------------------------|----------------------|-----------------|-------|---------------|
| Thermal Resistance from Junction to Ambient ( $t \leq 5s$ ) | PCB Mount<br>(Note ) | $R_{\theta JA}$ | 80    | $^{\circ}C/W$ |

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

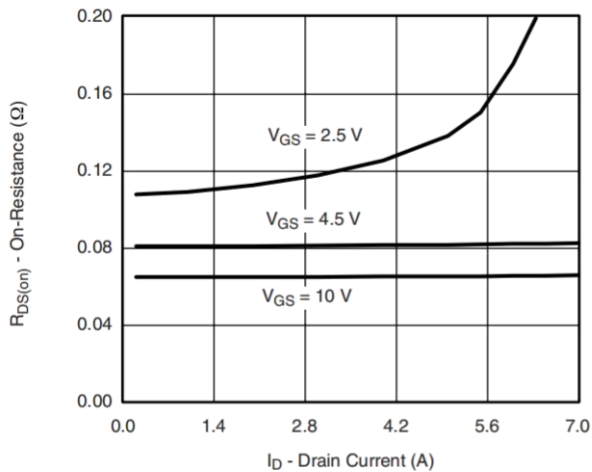
### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER                                               | CONDITIONS                                                              | SYMBOL       | MIN  | TYP  | MAX       | UNIT       |
|---------------------------------------------------------|-------------------------------------------------------------------------|--------------|------|------|-----------|------------|
| Static                                                  |                                                                         |              |      |      |           |            |
| Drain-Source Breakdown Voltage                          | $V_{GS}=0V, I_D = -250\mu A$                                            | $BV_{DSS}$   | -20  | --   | --        | V          |
| Gate-Source Threshold Voltage                           | $V_{DS}=V_{GS}, I_D = -250\mu A$                                        | $V_{GS(th)}$ | -0.4 | -0.6 | -1.0      | V          |
| Gate-Source Leakage                                     | $V_{DS}=0V, V_{GS}= \pm 10V$                                            | $I_{GSS}$    | --   | --   | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                         | $V_{DS}= -20V, V_{GS}=0V$                                               | $I_{DSS}$    | --   | -0.1 | -1        | $\mu A$    |
|                                                         | $V_{DS}= -20V, T_J=55^{\circ}C$                                         |              | --   | --   | -10       | $\mu A$    |
| Drain-Source On-State Resistance<br>(Note 1)            | $V_{GS}= -4.5V, I_D = -3A$                                              | $R_{DS(on)}$ | --   | 80   | 95        | m $\Omega$ |
|                                                         | $V_{GS}= -2.5V, I_D = -2A$                                              |              | --   | 100  | 120       |            |
| Forward Transconductance (Note 2)                       | $V_{DS}= -5V, I_D = -2A$                                                | $g_{fs}$     | --   | 10   | --        | S          |
| Dynamic (Note 2)                                        |                                                                         |              |      |      |           |            |
| Total Gate Charge (Note 3)                              | $V_{DS} = -10V,$<br>$I_D = -2.5A,$<br>$V_{GS} = -4.5V$                  | $Q_g$        | --   | 5.5  | --        | nC         |
| Gate-Source Charge (Note 3)                             |                                                                         | $Q_{gs}$     | --   | 0.8  | --        |            |
| Gate-Drain Charge (Note 3)                              |                                                                         | $Q_{gd}$     | --   | 1.8  | --        |            |
| Input Capacitance                                       | $V_{DS} = -10V, V_{GS} = 0V,$<br>$F = 1.0MHz$                           | $C_{iss}$    | --   | 470  | --        | pF         |
| Output Capacitance                                      |                                                                         | $C_{oss}$    | --   | 105  | --        |            |
| Reverse Transfer Capacitance                            |                                                                         | $C_{rss}$    | --   | 80   | --        |            |
| Switching                                               |                                                                         |              |      |      |           |            |
| Turn-On Delay Time (Note 3)                             | $V_{DS} = -10V,$<br>$I_D = -2A,$<br>$V_{GS} = -10V,$<br>$R_G = 6\Omega$ | $t_{d(on)}$  | --   | 5    | --        | nS         |
| Rise Time (Note 3)                                      |                                                                         | $t_r$        | --   | 20   | --        |            |
| Turn-Off Delay Time (Note 3)                            |                                                                         | $t_{d(off)}$ | --   | 22   | --        |            |
| Fall Time (Note 3)                                      |                                                                         | $t_f$        | --   | 10   | --        |            |
| Source-Drain Diode Ratings and Characteristics (Note 2) |                                                                         |              |      |      |           |            |
| Forward Voltage                                         | $V_{GS} = 0V, I_F = -1A$                                                | $V_{SD}$     | --   | -0.8 | -1.1      | V          |
| Continuous Source Current                               | Integral reverse diode<br>in the MOSFET                                 | $I_S$        | --   | --   | -3        | A          |
| Pulsed Current (Note 1)                                 |                                                                         | $I_{SM}$     | --   | --   | -7        | A          |

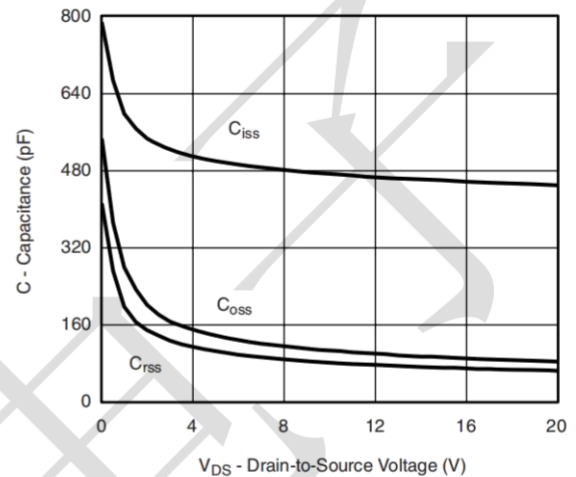
Notes:

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

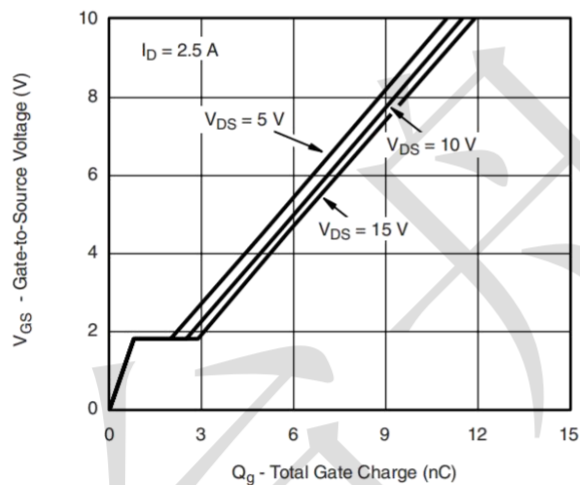
### TYPICAL CHARACTERISTICS



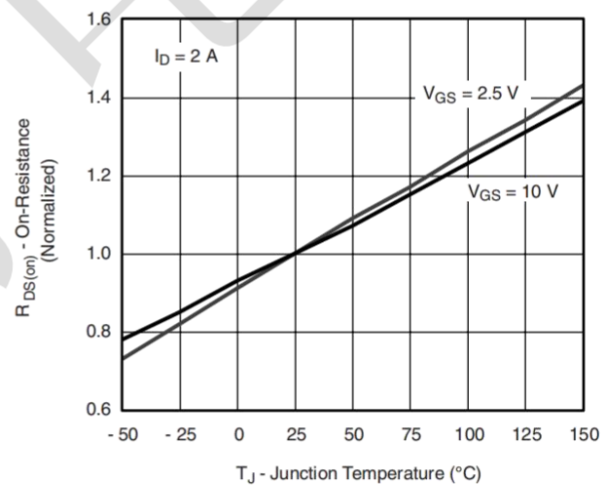
On-Resistance vs. Drain Current and Gate Voltage



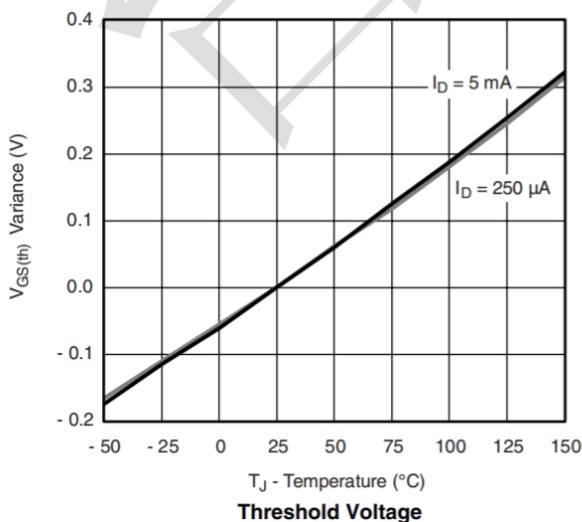
Capacitance



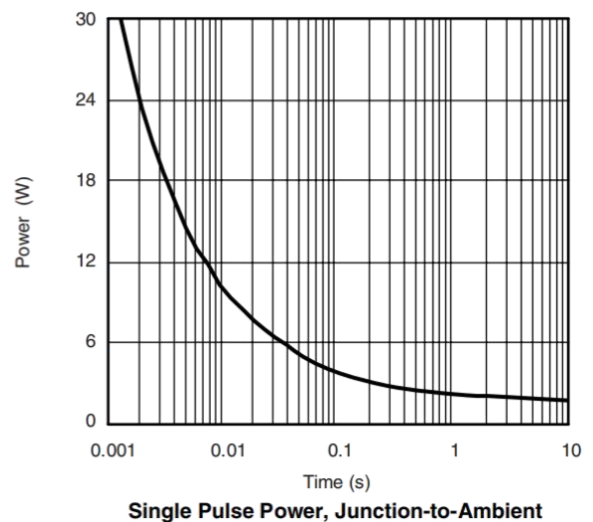
Gate Charge



On-Resistance vs. Junction Temperature



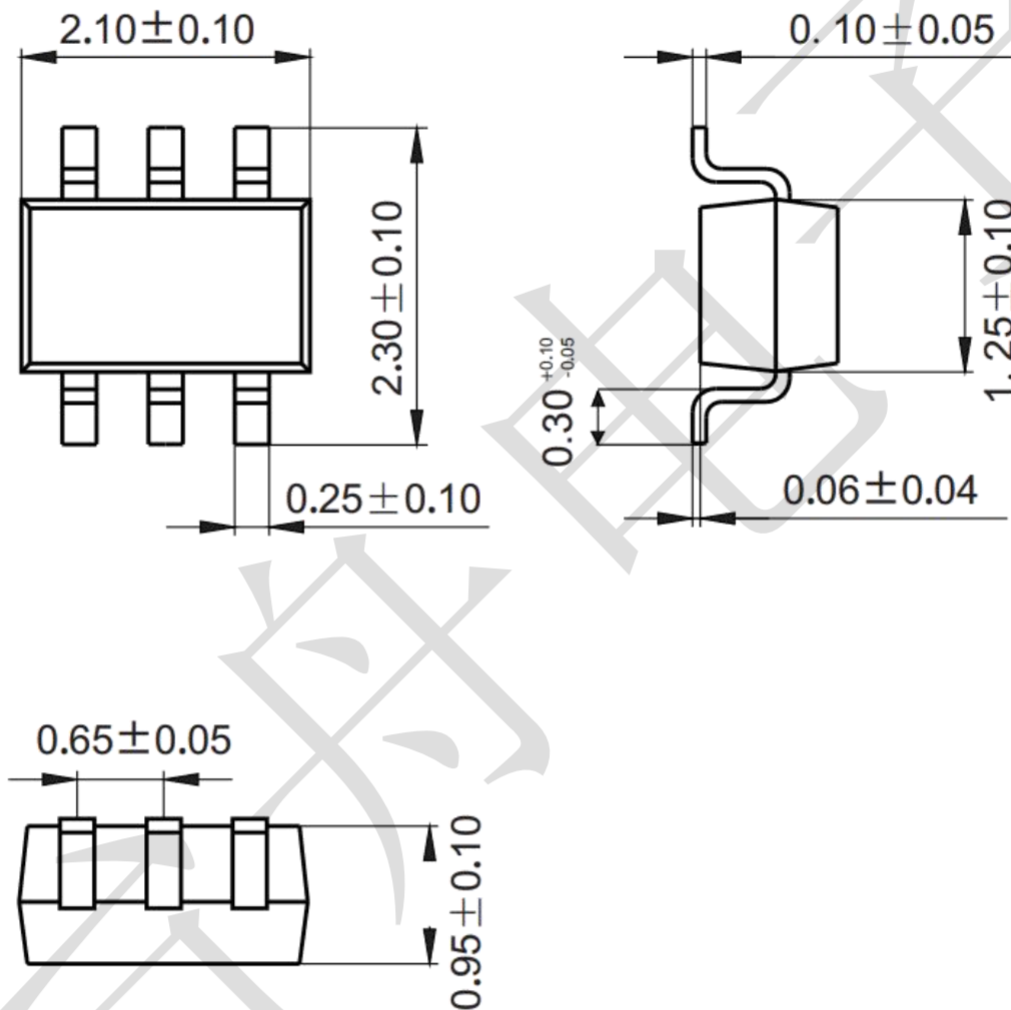
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

**Package information (Unit: mm)**

SOT-363



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

