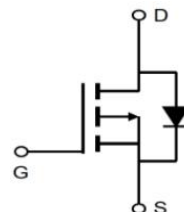


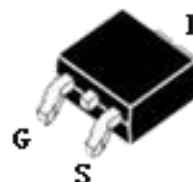
### MAIN CHARACTERISTICS

|                                       |               |
|---------------------------------------|---------------|
| $I_D$                                 | -50 A         |
| $V_{DSS}$                             | -20 V         |
| $R_{DS(on)-typ}$<br>(@ $V_{GS}=10V$ ) | 6.6m $\Omega$ |



### FEATURES

- Adopt advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



TO-252

### APPLICATIONS

- Battery protection
- Load switch
- Uninterruptible power supply

### MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106

### Product specification classification

| Part Number | Package | Mode Name | Pack |
|-------------|---------|-----------|------|
| LT50P02AD   | TO-252  | LT50P02AD | Tape |

### Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics                         | Symbol          | Value       | Unit |
|-----------------------------------------|-----------------|-------------|------|
| Drain-Source Voltage                    | $V_{DS}$        | -20         | V    |
| Gate-Source Voltage                     | $V_{GS}$        | $\pm 12$    | V    |
| Continue Drain Current                  | $I_D$           | -50         | A    |
| Pulsed Drain Current (Note1)            | $I_{DM}$        | -240        | A    |
| Power Dissipation                       | $P_D$           | 70          | W    |
| Operating Temperature Range             | $T_J$           | 150         | °C   |
| Storage Temperature Range               | $T_{STG}$       | -55 to +150 | °C   |
| Thermal Resistance, Junction to Case    | $R_{\theta JC}$ | 2.1         | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62          | °C/W |

Note1:Pulse test: 300  $\mu$ s pulse width, 2 % duty cycle

### Electrical Characteristics at Tc=25°C unless otherwise specified

| Characteristics                  | Test Condition                                                                          | Symbol       | Min  | Typ  | Max       | Unit          |
|----------------------------------|-----------------------------------------------------------------------------------------|--------------|------|------|-----------|---------------|
| Drain-Source Breakdown Voltage   | $V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$                                          | $BV_{DSS}$   | -20  | -    | -         | V             |
| Drain-Source Leakage Current     | $V_{DS} = -20 \text{ V}, V_{GS} = 0 \text{ V}$                                          | $I_{DSS}$    | -    | -    | -1        | $\mu\text{A}$ |
| Gate Leakage Current             | $V_{GS} = \pm 12 \text{ V}, V_{DS} = 0 \text{ V}$                                       | $I_{GSS}$    | -    | -    | $\pm 100$ | nA            |
| Gate-Source Threshold Voltage    | $V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$                                               | $V_{GS(th)}$ | -0.4 | -    | -1        | V             |
| Drain-Source On-State Resistance | $V_{GS} = -4.5 \text{ V}, I_D = -15 \text{ A}$                                          | $R_{DS(on)}$ | -    | 6.6  | 8.6       | m $\Omega$    |
|                                  | $V_{GS} = -2.5 \text{ V}, I_D = -10 \text{ A}$                                          | $R_{DS(on)}$ | -    | 8.5  | 12        | m $\Omega$    |
| Input Capacitance                | $V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1.0 \text{ MHz}$                     | $C_{iss}$    | -    | 4590 | -         | pF            |
| Output Capacitance               |                                                                                         | $C_{oss}$    | -    | 505  | -         | pF            |
| Reverse Transfer Capacitance     |                                                                                         | $C_{rss}$    | -    | 440  | -         | pF            |
| Turn-on Delay Time(Note2)        | $V_{DS} = -10 \text{ V}, V_{GS} = -10 \text{ V}, R_G = 2.7 \Omega, I_D = -14 \text{ A}$ | $t_{d(ON)}$  | -    | 8    | -         | ns            |
| Rise Time(Note2)                 |                                                                                         | $t_r$        | -    | 59   | -         | ns            |
| Turn-Off Delay Time(Note2)       |                                                                                         | $t_{d(OFF)}$ | -    | 111  | -         | ns            |
| Fall Time(Note2)                 |                                                                                         | $t_f$        | -    | 43   | -         | ns            |
| Total Gate Charge(Note2)         | $V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -15 \text{ A}$                  | $Q_G$        | -    | 46   | -         | nC            |
| Gate to Source Charge(Note2)     |                                                                                         | $Q_{GS}$     | -    | 7.3  | -         | nC            |
| Gate to Drain Charge(Note2)      |                                                                                         | $Q_{GD}$     | -    | 10   | -         | nC            |

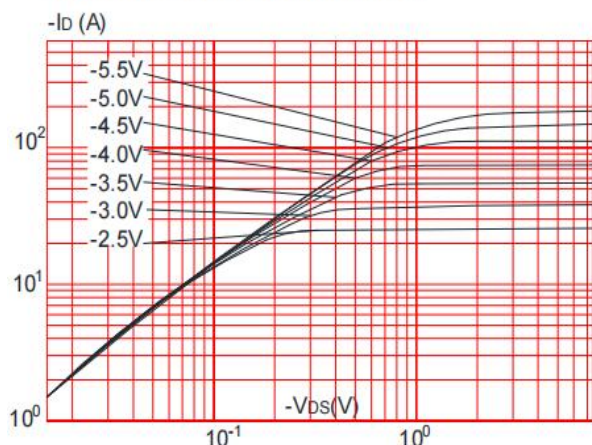
### Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

| Characteristics                          | Test Condition                                                         | Symbol   | Min. | Typ. | Max. | Unit |
|------------------------------------------|------------------------------------------------------------------------|----------|------|------|------|------|
| Maximun Body-Diode Continuous Current    |                                                                        | $I_S$    | -    | -    | -50  | A    |
| Maximun Body-Diode Pulsed Current(Note2) |                                                                        | $I_{SM}$ | -    | -    | -240 | A    |
| Drain-Source Diode Forward Voltage       | $V_{GS} = 0 \text{ V}, I_S = -20 \text{ A}, T_J = 25^\circ\text{C}$    | $V_{SD}$ | -    | -    | -1.2 | V    |
| Reverse Recovery Time(Note2)             | $T_J = 25^\circ\text{C}, I_{SD} = -15 \text{ A}, V_{GS} = 0 \text{ V}$ | $t_{rr}$ | -    | 18   | -    | ns   |
| Reverse Recovery Charge(Note2)           | $di/dt = -100 \text{ A}/\mu\text{s}$                                   | $Q_{rr}$ | -    | 7.7  | -    | nC   |

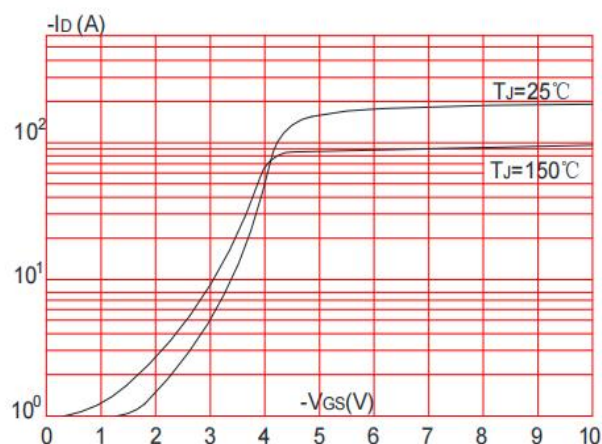
Note2:Pulse test: 300  $\mu$ s pulse width, 2 % duty cycle

### RATINGS AND CHARACTERISTIC CURVES

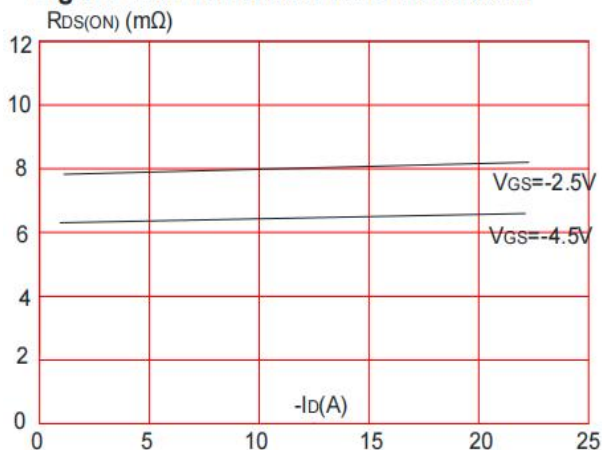
**Figure1: Output Characteristics**



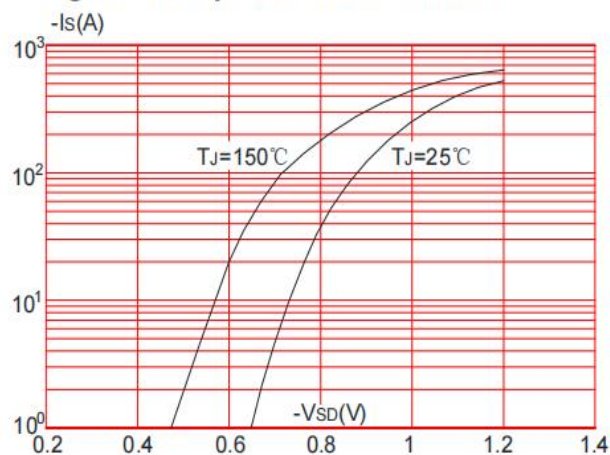
**Figure 2: Typical Transfer Characteristics**



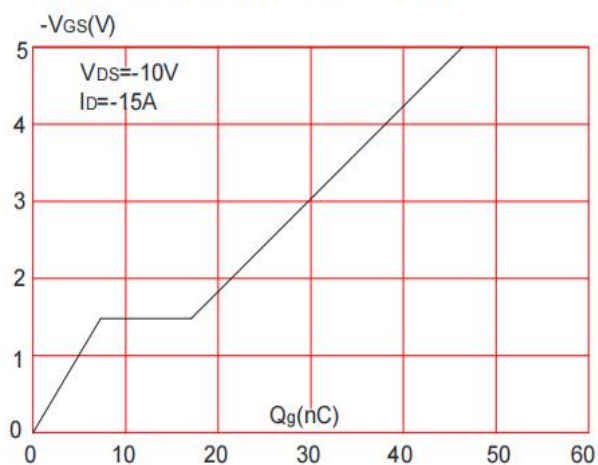
**Figure 3: On-resistance vs. Drain Current**



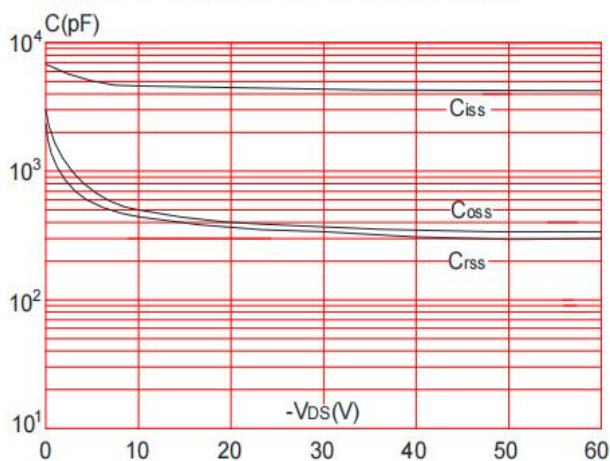
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

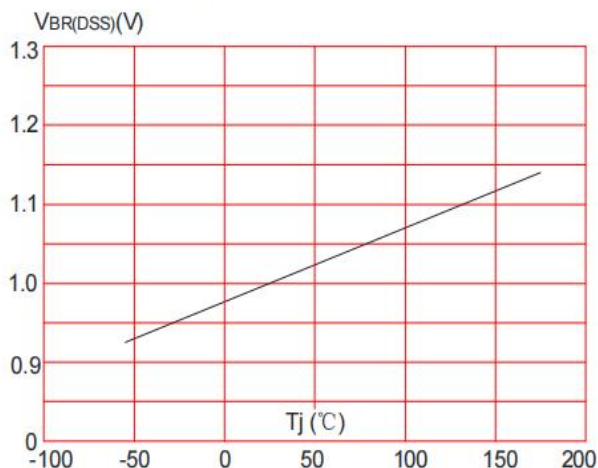


**Figure 6: Capacitance Characteristics**

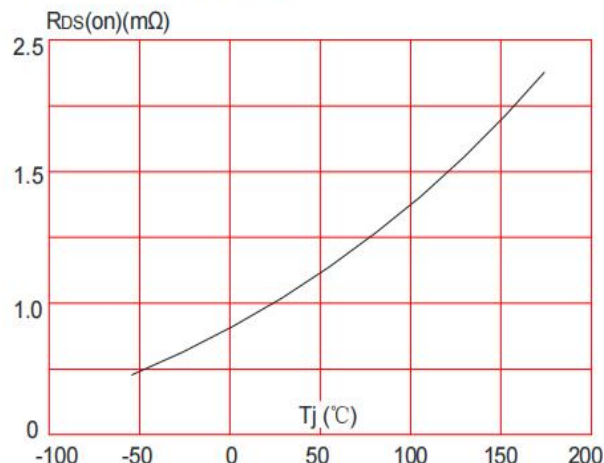


### RATINGS AND CHARACTERISTIC CURVES

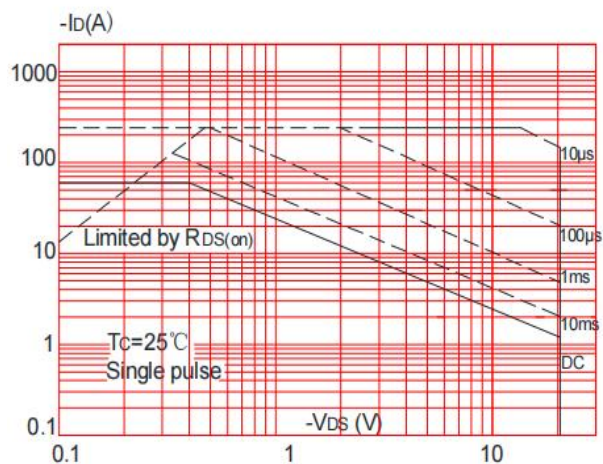
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



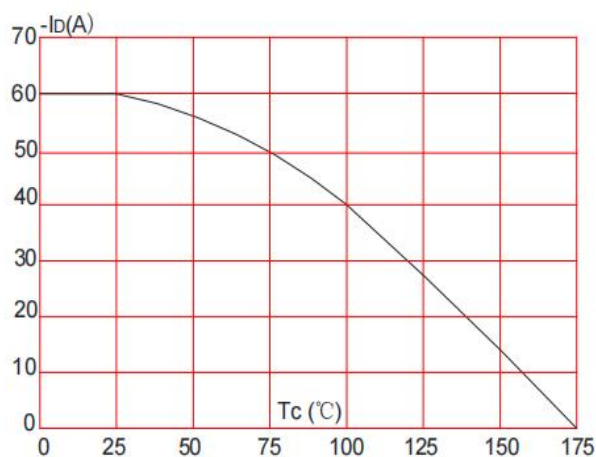
**Figure 8:** Normalized on Resistance vs. Junction Temperature



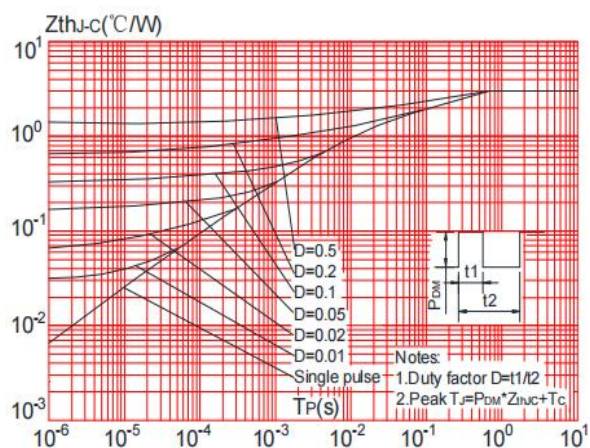
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

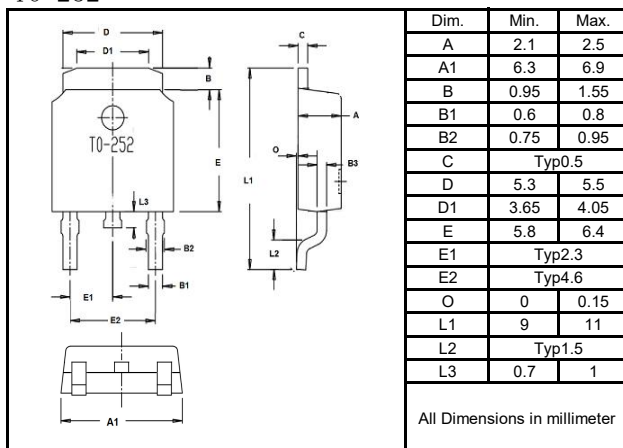


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case

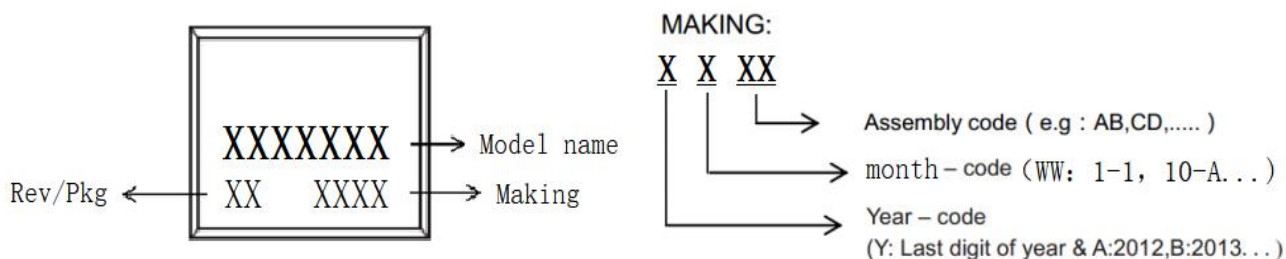


### Package Outline Dimensions millimeters

TO-252



### Marking on the body



### packing instruction

| PKG    | 最小包装                                                                                | 内盒                                                                                  | 外箱                                                                                    |
|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| TO-252 |  |  |  |
|        | 2500pcs/盘                                                                           | 5000pcs/盒                                                                           | 25000pcs/箱                                                                            |

### Notice

All product,product specifications and data are subject to change without notice to improve.The right to explain is owned by LINGXUN electronics

company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying poer exceeding normal rated

poer; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.