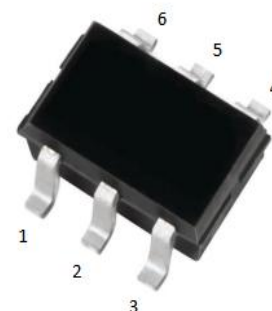




### 1. Features

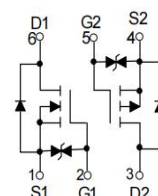
- High-Side Switching
- Low Threshold
- Fast Switching Speed
- APPLICATION:
  - Drivers:Relays, Solenoids, Memories
  - Battery Operated Systems
  - Power Supply Converter Circuits
  - Load/Power Switching Cell Phones, Pagers

SOT-363



### 2. Mechanical Data

- Case:Molded Plastic,SOT-363 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: .75
- Mounting Position : Any.



### 3. Maximum Ratings

Electrical Characteristics Rating at 25°C ambient temperature unless otherwise specified.

| Characteristic                                        | Symbol          | Value    | Unit |
|-------------------------------------------------------|-----------------|----------|------|
| N-Channel MOSFET                                      |                 |          |      |
| Drain-Source Voltage                                  | $V_{DS}$        | 60       | V    |
| Gate-Source Voltage                                   | $V_{GS}$        | $\pm 20$ | V    |
| Continuous Drain Current                              | $I_D$           | 0.34     | A    |
| Drain Current - Pulsed(Note1)                         | $I_{DM}$        | 1.36     | A    |
| P-Channel MOSFET                                      |                 |          |      |
| Drain-Source Voltage                                  | $V_{DS}$        | -50      | V    |
| Gate-Source Voltage                                   | $V_{GS}$        | $\pm 20$ | V    |
| Continuous Drain Current                              | $I_D$           | -0.18    | A    |
| Drain Current - Pulsed(Note1)                         | $I_{DM}$        | -0.7     | A    |
| Power Dissipation, Temperature and Thermal Resistance |                 |          |      |
| Power Dissipation                                     | $P_D$           | 150      | mW   |
| Thermal Resistance from Junction to Ambient(Note2)    | $R_{\theta JA}$ | 833      | °C/W |
| Junction Temperature                                  | $T_J$           | -55~+150 | °C   |
| Storage Temperature                                   | $T_{stg}$       | -55~+150 | °C   |
| Lead Temperature                                      | $T_L$           | 260      | °C   |



### 4. Electrical Characteristics( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Characteristics                    | Symbol               | Condition                                                                                  | Min  | TYP   | Max  | Unit |
|------------------------------------|----------------------|--------------------------------------------------------------------------------------------|------|-------|------|------|
| N-Channel MOSFET                   |                      |                                                                                            |      |       |      |      |
| Drain-source breakdown voltage     | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                                | 60   | -     | -    | V    |
| Zero gate voltage drain current    | I <sub>DSS</sub>     | V <sub>DS</sub> =48V, V <sub>GS</sub> = 0V                                                 | -    | -     | 1    | μA   |
| Gate-body leakage current          | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V                                                | -    | -     | ±10  | μA   |
|                                    |                      | V <sub>GS</sub> =±10V, V <sub>DS</sub> = 0V                                                | -    | -     | ±200 | nA   |
|                                    |                      | V <sub>GS</sub> =±5V, V <sub>DS</sub> = 0V                                                 | -    | -     | ±100 | nA   |
| Gate threshold voltage(note 3)     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA                                     | 1.0  | 1.3   | 2.5  | V    |
| Drain-source on-resistance(note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =500mA                                                | -    | 0.9   | 5    | Ω    |
|                                    |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA                                               | -    | 1.1   | 5.3  |      |
| Diode Forward voltage              | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =0.3A                                                  | -    | -     | 1.5  | V    |
| DYNAMIC PARAMETERS (note 4)        |                      |                                                                                            |      |       |      |      |
| Input Capacitance                  | C <sub>iss</sub>     | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f =1MHz                                         | -    | -     | 40   | pF   |
| Output Capacitance                 | C <sub>oss</sub>     |                                                                                            | -    | -     | 30   |      |
| Reverse Transfer Capacitance       | C <sub>rss</sub>     |                                                                                            | -    | -     | 10   |      |
| SWITCHING PARAMETERS (note 4)      |                      |                                                                                            |      |       |      |      |
| Turn-on delay time                 | t <sub>d(on)</sub>   | V <sub>DD</sub> =50V, V <sub>GS</sub> =10V,<br>R <sub>L</sub> =250Ω, R <sub>GEN</sub> =50Ω | -    | -     | 10   | ns   |
| Turn-off delay time                | t <sub>d(off)</sub>  |                                                                                            | -    | -     | 15   |      |
| Reverse recovery time              | t <sub>rr</sub>      | I <sub>S</sub> =300mA; d <sub>I</sub> S/d <sub>t</sub> =-100A/s;                           | -    | 30    | -    | ns   |
| Recovered charge                   | Q <sub>r</sub>       | V <sub>GS</sub> =0V; V <sub>R</sub> =25V                                                   | -    | 30    | -    | nC   |
| P-Channel MOSFET                   |                      |                                                                                            |      |       |      |      |
| Drain-source breakdown voltage     | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =-250μA                                               | -50  | -     | -    | V    |
| Zero gate voltage drain current    | I <sub>DSS</sub>     | V <sub>DS</sub> =-50V, V <sub>GS</sub> = 0V                                                | -    | -     | -15  | μA   |
|                                    |                      | V <sub>DS</sub> =-25V, V <sub>GS</sub> = 0V                                                | -    | -     | -0.1 | μA   |
| Gate-body leakage current          | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V                                                | -    | -     | ±10  | μA   |
| Gate threshold voltage(note 3)     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                  | -0.9 | -1.62 | -2   | V    |
| Drain-source on-resistance(note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =-10V, I <sub>D</sub> =-0.1A                                               | -    | 4.1   | 8    | Ω    |
|                                    |                      | V <sub>GS</sub> =-5V, I <sub>D</sub> =-0.1A                                                | -    | 5.5   | 10   |      |
| Forward transconductance (note 3)  | g <sub>FS</sub>      | V <sub>DS</sub> =-25V, I <sub>D</sub> =-0.1A                                               | 0.05 | -     | -    | S    |
| Diode forward voltage (note 3)     | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =0.13A                                                 | -    | -     | -2.2 | V    |
| DYNAMIC PARAMETERS (note 4)        |                      |                                                                                            |      |       |      |      |
| Input Capacitance                  | C <sub>iss</sub>     | V <sub>DS</sub> =-5V, V <sub>GS</sub> =0V, f =1MHz                                         | -    | 30    | -    | pF   |
| Output Capacitance                 | C <sub>oss</sub>     |                                                                                            | -    | 10    | -    |      |
| Reverse Transfer Capacitance       | C <sub>rss</sub>     |                                                                                            | -    | 5     | -    |      |
| SWITCHING PARAMETERS (note 4)      |                      |                                                                                            |      |       |      |      |
| Turn-on delay time                 | t <sub>d(on)</sub>   | V <sub>DD</sub> =-15V,<br>R <sub>L</sub> =50Ω, I <sub>D</sub> =-2.5A                       | -    | 2.5   | -    | ns   |
| Turn-on rise time                  | t <sub>r</sub>       |                                                                                            | -    | 1     | -    |      |
| Turn-off delay time                | t <sub>d(off)</sub>  |                                                                                            | -    | 16    | -    |      |
| Turn-off fall time                 | t <sub>f</sub>       |                                                                                            | -    | 8     | -    |      |

#### Notes:

1. Surface mounted on FR-4 board using minimum pad size, 1oz copper
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
4. These parameters have no way to verify.



### 5. Rating And Characteristic Curves

#### N-Channel MOSFET

Fig.1 Output Characteristics

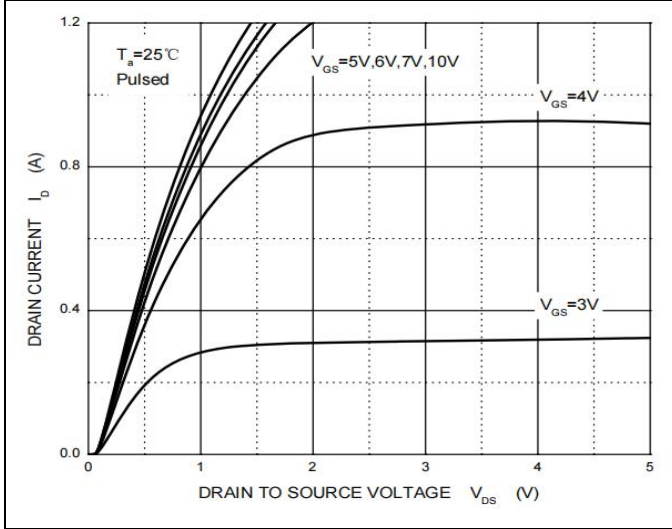


Fig.2 Transfer Characteristics

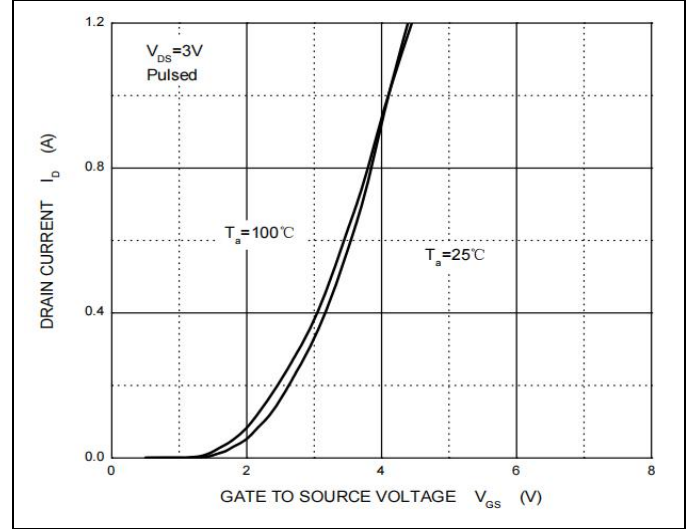


Fig.3  $R_{DS(ON)} - I_D$

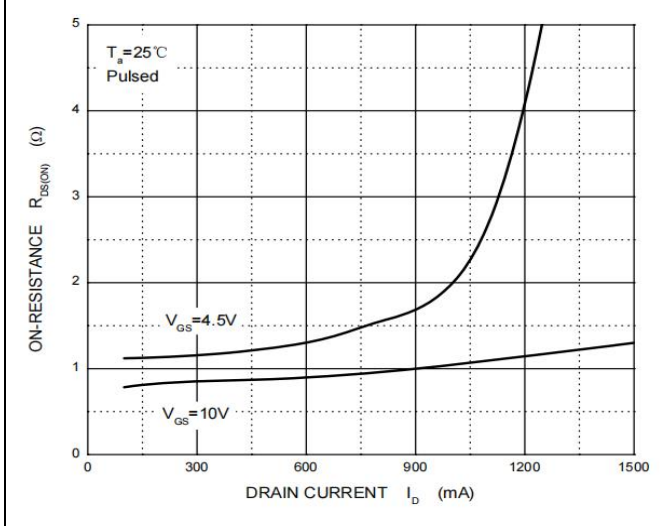


Fig.4  $R_{DS(ON)} - V_{GS}$

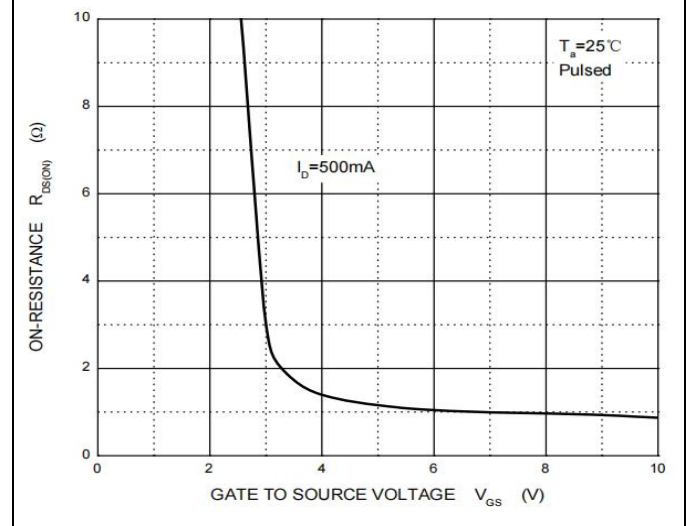


Fig.5  $I_S - V_{SD}$

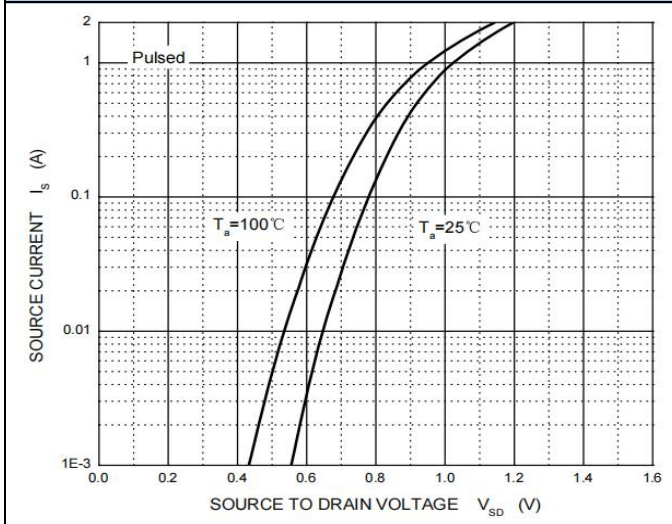
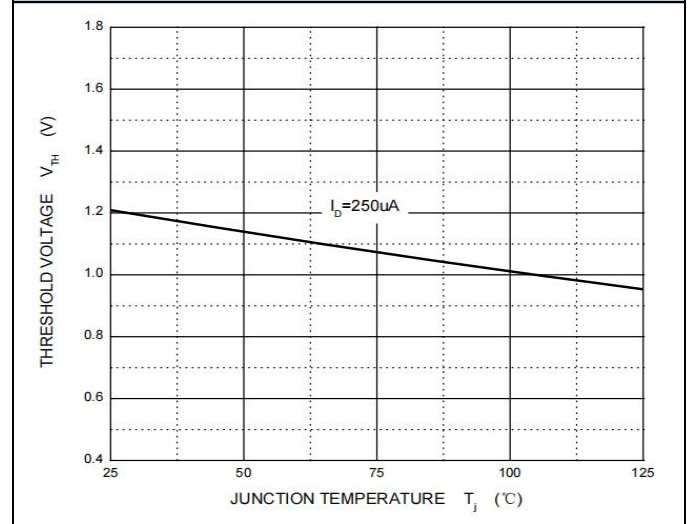


Fig.6 Threshold Voltage





### P-Channel MOSFET

Fig.1 Output Characteristics

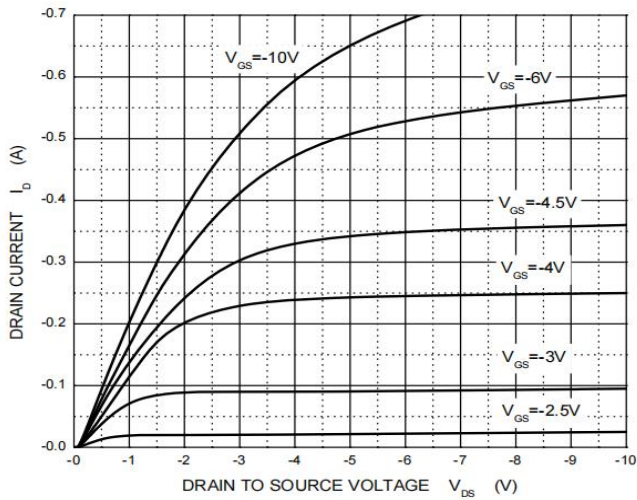


Fig.2 Transfer Characteristics

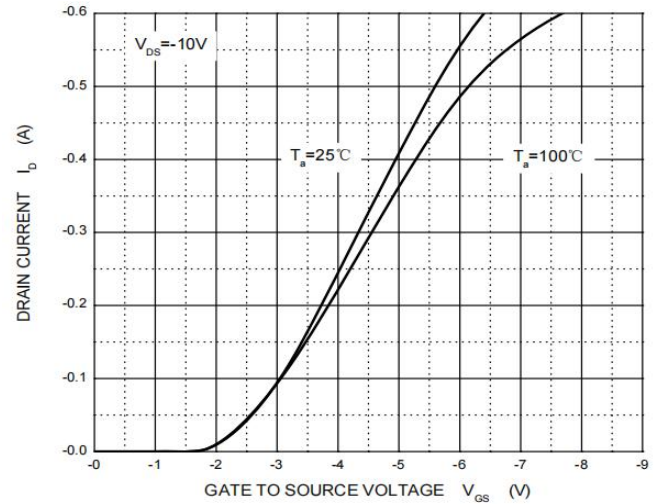


Fig.3  $R_{DS(ON)} - I_D$

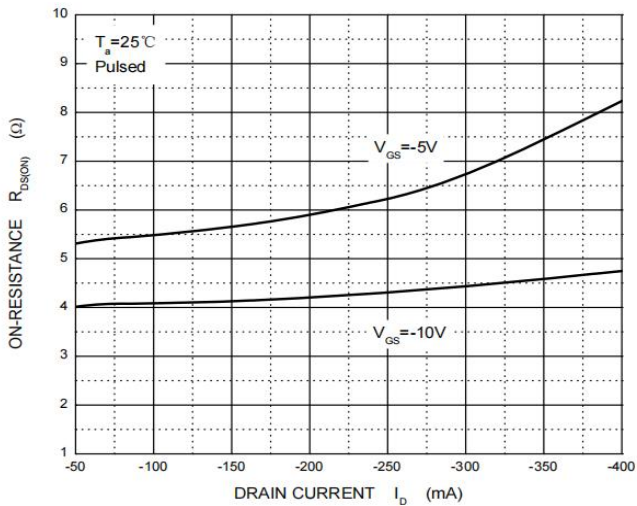


Fig.4  $R_{DS(ON)} - V_{GS}$

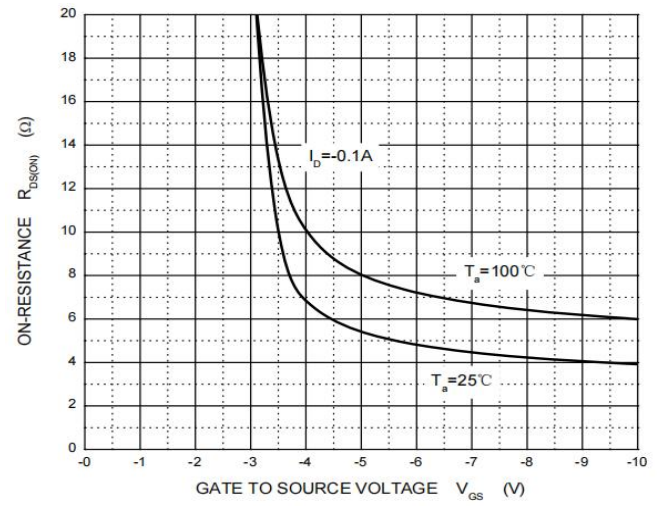


Fig.5  $I_S - V_{SD}$

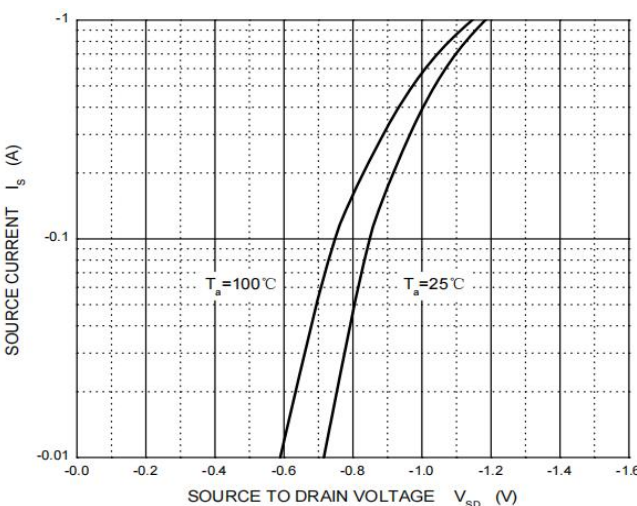
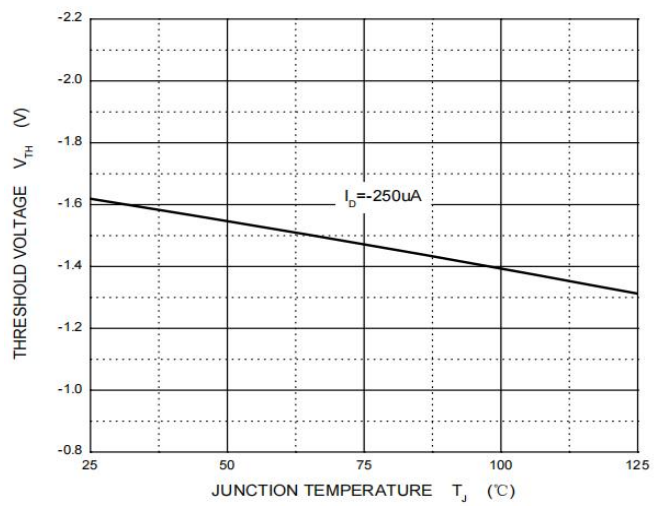
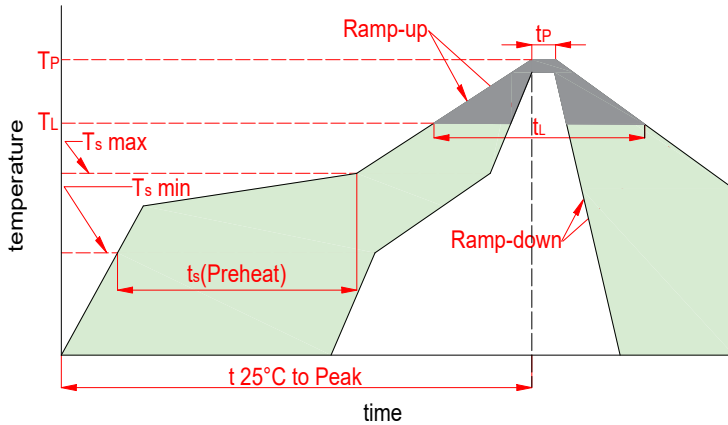


Fig.6 Threshold Voltage



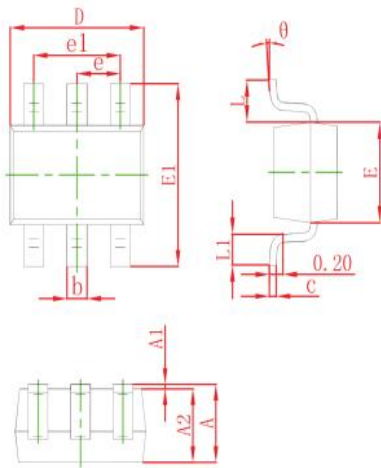


### 6. Soldering Parameters



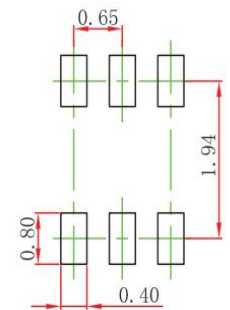
| Reflow Condition                                   |                           | Lead-free              |
|----------------------------------------------------|---------------------------|------------------------|
| Pre Heat                                           | Temp. min( $T_s$ (min))   | 150℃                   |
|                                                    | Temp. max( $T_s$ (min))   | 200℃                   |
|                                                    | Time(min to max)( $t_s$ ) | 60~120s                |
| Aver. ramp up rate(Liquidus Temp.)( $T_L$ )to peak |                           | 3℃/s max               |
| $T_s$ (max) to $T_L$ -Ramp-up Rate                 |                           | 3℃/s max               |
| Reflow                                             | Temp. ( $T_L$ )(Liquidus) | 217℃                   |
|                                                    | Temp. ( $t_L$ )(Liquidus) | 60~150s                |
| Peak Temp. ( $T_P$ )                               |                           | 260 <sup>+0/-5</sup> ℃ |
| Time within actual peak Temp. ( $t_p$ )            |                           | 30s max                |
| Ramp-down Rate                                     |                           | 6℃/s max               |
| Time 25℃ to peak Tempe. ( $T_P$ )                  |                           | 8 minutes max          |
| Do not exceed                                      |                           | 260℃                   |

### 7. Dimensions

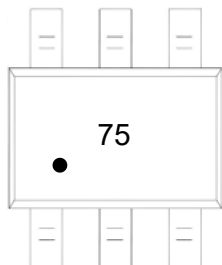


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.035  | 0.043 | 0.900       | 1.100 |
| A1         | 0.000  | 0.004 | 0.000       | 0.100 |
| A2         | 0.035  | 0.039 | 0.900       | 1.000 |
| b          | 0.010  | 0.018 | 0.250       | 0.450 |
| c          | 0.003  | 0.006 | 0.080       | 0.150 |
| D          | 0.079  | 0.087 | 2.000       | 2.200 |
| E          | 0.045  | 0.053 | 1.150       | 1.350 |
| E1         | 0.085  | 0.100 | 2.150       | 2.550 |
| e1         | 0.047  | 0.055 | 1.200       | 1.400 |
| L1         | 0.010  | 0.018 | 0.250       | 0.460 |

Mounting PAD Layout



### 8. Part Marking System



### 9. Package Information

| Package | Part Number | Tape Width(mm) | Quantity(pcs) |
|---------|-------------|----------------|---------------|
| SOT-363 | XN7252KDW   | 8              | 3000          |



### Important Notice and Disclaimer

- Reproducing and modifying information of the document is prohibited without from XINNUO.
- XINNUO reserves the right to make changes to this document and its products and specifications.
- XINNUO disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- XINNUO does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the here in document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. XINNUO makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown her are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify XINNUO for any damages resulting from such improper use or sale.
- Since XINNUO uses lot number as the tracking base, please provide the lot number for tracking when complaining.