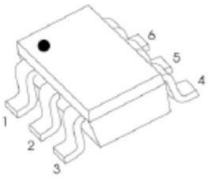
## Features

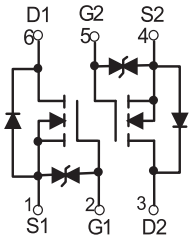
High density cell design for Low $R_{DS(on)}$
Voltage controlled small signal switch
Rugged and reliable
High saturation current capability
ESD protected (2KV HBM)

72K

SOT-363




**Equivalent Circuit**




## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

**MAXIMUM RATINGS ( $T_a$=25℃ unless otherwise noted )**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source voltage | 60 | V |
| $V_{GS}$ | Gate-Source voltage | ±20 | V |
| $I_D$ | Drain Current | 300 | mA |
| $P_D$ | Power Dissipation | 0.15 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55-150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance fromJunction to Ambient | 833 | ℃ /W |

## Electrical Characteristics ($T_a$=25℃unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{DS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 60 | | | V |
| Gate Threshold Voltage* | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =1mA | 1 | 1.3 | 2.5 | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =48V,$V_{GS}$ = 0V | | | 1 | μA |
| Gate –Source leakage current | $I_{GSS1}$ | $V_{GS}$ =±20V, $V_{DS}$ = 0V | | | ±10 | μA |
| Drain-Source On-Resistance* | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ =200mA | | 1.1 | 5.3 | Ω |
| | | $V_{GS}$ =10V,$I_D$ =500mA | | 0.9 | 5 | Ω |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=300mA | | | 1.5 | V |
| Recovered charge | $Q_r$ | $V_{GS}$=0V,$I_S$=300mA,$V_R$=25V, $dI_S/dt$=-100A/μs | | 30 | | nC |
| **Dynamic Characteristics**** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =10V,$V_{GS}$ =0V,f =1MHz | | | 40 | pF |
| Output Capacitance | $C_{oss}$ | | | | 30 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 10 | pF |
| **Switching Characteristics**** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$=10V,$V_{DD}$=50V,$R_G$=50Ω, $R_{GS}$=50Ω, $R_L$=250Ω | | | 10 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 15 | ns |
| Reverse recovery Time | $t_{rr}$ | $V_{GS}$=0V,$I_S$=300mA,$V_R$=25V, $dI_S/dt$=-100A/μs | | 30 | | ns |
| **GATE-SOURCE ZENER DIODE** | | | | | | |
| Gate-Source Breakdown Voltage | $BV_{GSO}$ | $I_{gs}$=±1mA (Open Drain) | ±21.5 | | ±30 | V |

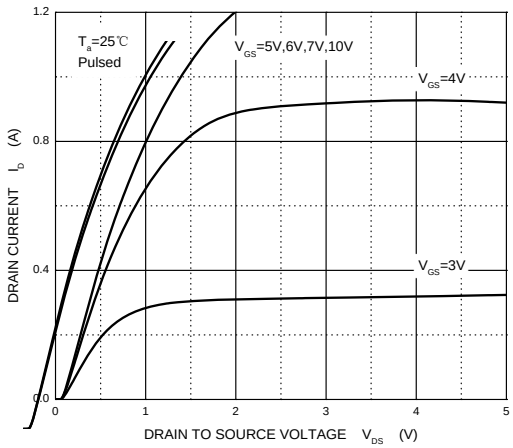
**Notes :**

*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%.

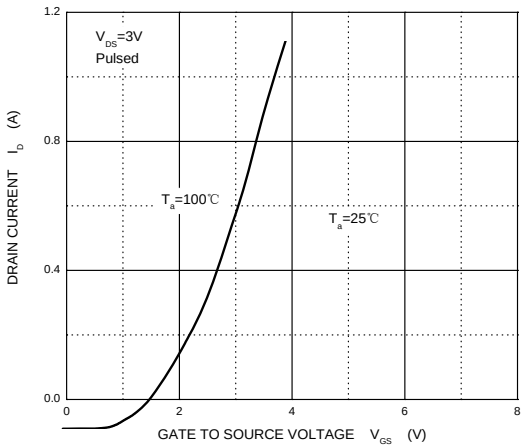
**These parameters have no way to verify.

## RATING AND CHARACTERISTIC CURVES

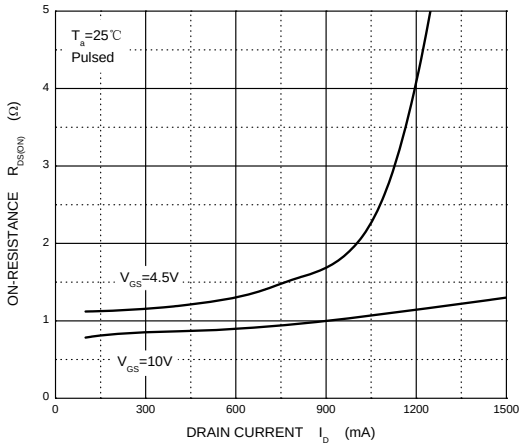
**Output Characteristics**



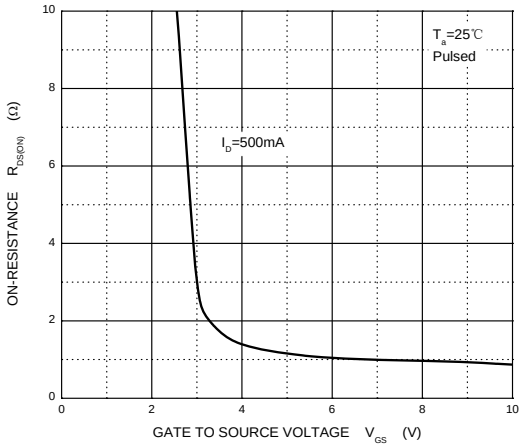

**Transfer Characteristics**



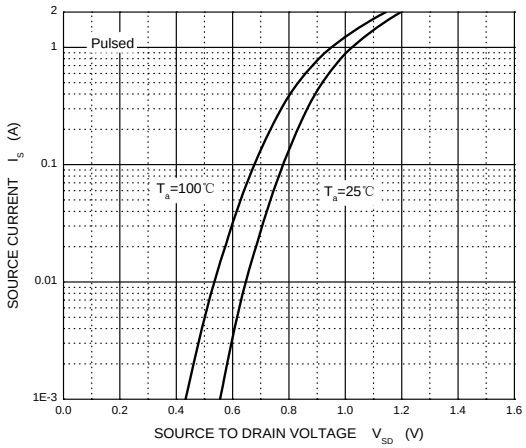

**$R_{DS(ON)}$ — $I_D$**



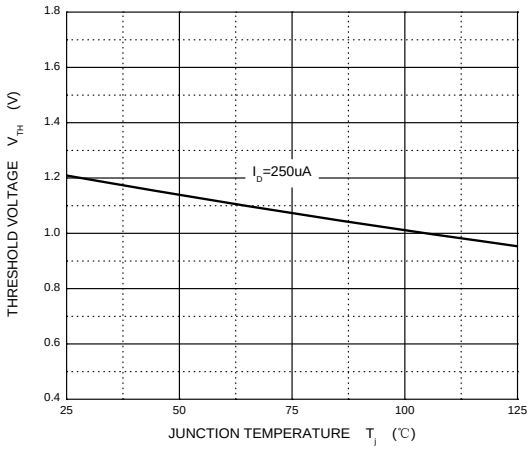

**$R_{DS(ON)}$ — $V_{GS}$**




**$I_S$ — $V_{SD}$**



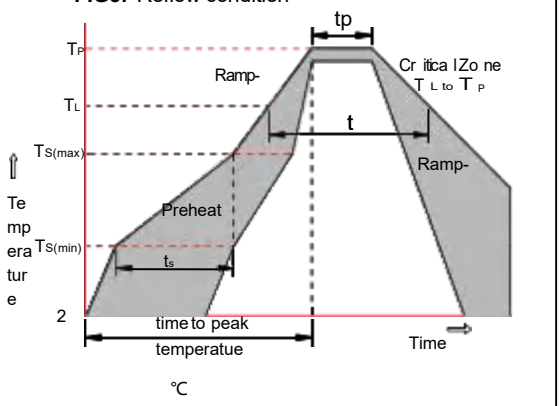

**Threshold Voltage**



## Soldering parameters

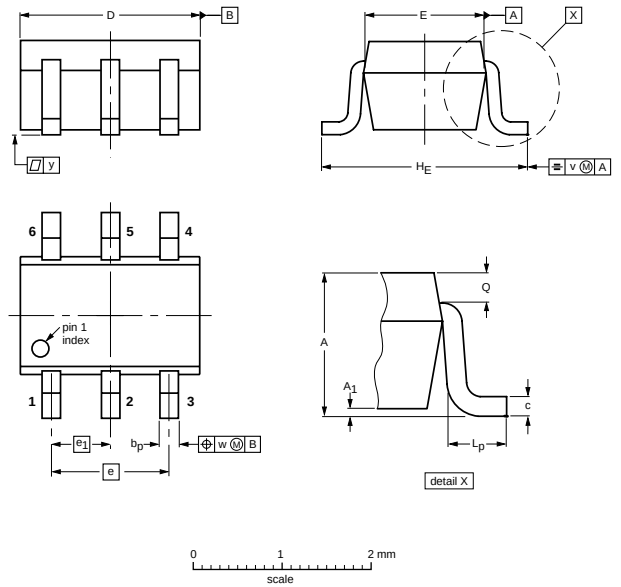
| Reflow Condition | | Pb-Free assembly (see as bellow) |
|---|---|---|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150℃ |
| | -Temperature Max($T_{s(max)}$) | +200℃ |
| | -Time (Min to Max) (ts) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp ($T_L$) to peak) | | 3℃/sec. Max |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate | | 3℃/sec. Max |
| Reflow | -Temperature($T_L$)(Liquid us) | +217℃ |
| | -Temperature($t_L$) | 60-150 secs. |
| Peak Temp ($T_p$) | | +260(+0/-5)℃ |
| Time within 5℃ of actual Peak Temp ($t_p$) | | 30 secs. Max |
| Ramp-down Rate | | 6℃/sec. Max |
| Time 25℃ to Peak Temp ($T_P$) | | 8 min. Max |
| Do not exceed | | +260℃ |

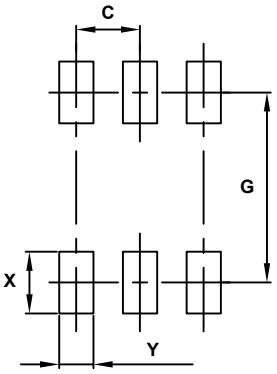
**FIG5:** Reflow condition




## Package Dimensions & Suggested Pad Layout

**SOT-363**



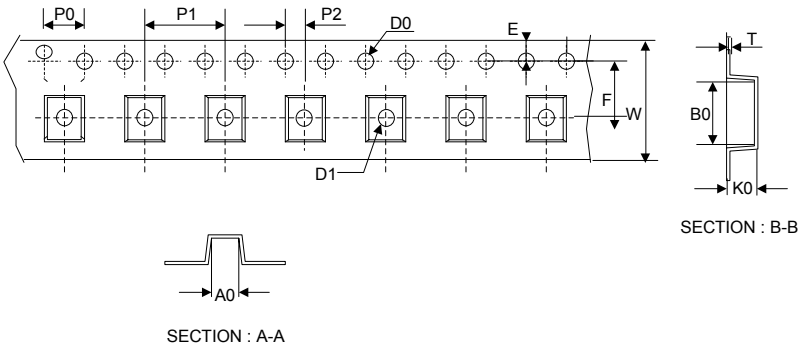

| Dimensions | Value (in mm) |
|---|---|
| C | 0.65 |
| G | 1.90 |
| X | 0.85 |
| Y | 0.40 |

DIMENSIONS (mm are the original dimensions)

| UNIT | A | $A_1$ max | $b_p$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | Q | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.8 | 0.1 | 0.30<br>0.20 | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65 | 2.2<br>2.0 | 0.45<br>0.15 | 0.25<br>0.15 | 0.2 | 0.2 | 0.1 |

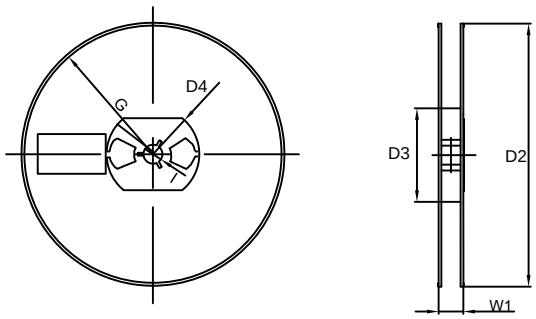
## Tape & rell specification

Tape




| Symbol | Dimension (mm) |
|---|---|
| P0 | 4.00±0.20 |
| P1 | 4.00±0.20 |
| P2 | 2.00±0.20 |
| D0 | 1.55±0.20 |
| D1 | 1.00±0.20 |
| E | 1.55±0.25 |
| F | 3.60±0.20 |
| W | 8.00±0.20 |
| A0 | 3.00±0.20 |
| B0 | 3.00±0.20 |
| K0 | 1.30±0.20 |
| T | 0.20±0.20 |

7" Reel




| | |
|---|---|
| D2 | 177.0±5.0 |
| D3 | 55Min. |
| D4 | R24.6±2.0 |
| G | R82.0±2.0 |
| I | 13.0±2.0 |
| W1 | 10.20±3.0 |

Quantity: 3000PCS

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