## ESD protected N-Channel Enhancement Mode MOSFET

# 2SK3018S3

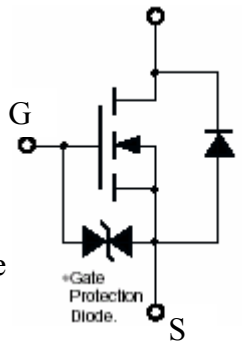
| | |
|---|---|
| $BV_{DSS}$ | 30V |
| $I_D$ | 100mA |
| $R_{DSON(MAX)}$ | 8Ω |

## Description

- Low voltage drive(2V drive) makes this device ideal for portable equipment.
- High speed switching
- ESD protected device
- Pb-free lead plating & halogen-free package

## Symbol

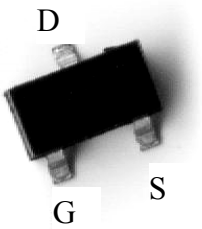
2SK3018S3




G：Gate
S：Source
D：Drain

## Outline

SOT-323




## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| 2SK3018S3-0-T1-G | SOT-323<br>(Pb-free lead plating & halogen-free package) | 3000 pcs / Tape & Reel |

Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel,7” reel

Product rank, zero for no rank products

Product name

## Absolute Maximum Ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $BV_{DSS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Drain Current | Continuous | $I_D$ | ±100 | mA |
| | Pulsed | $I_{DP}$ | ±200 *1 | mA |
| Reverse Drain Current | Continuous | $I_{DR}$ | ±100 | mA |
| | Pulsed | $I_{DRP}$ | ±200 *1 | mA |
| Total Power Dissipation | | $P_D$ | 200 *2 | mW |
| ESD susceptibility | | | 750 *3 | V |
| Operating Junction and Storage Temperature Range | | Tj ; Tstg | -55~+150 | °C |
| Thermal Resistance, Junction-to-Ambient | | Rth,ja | 556 | °C/W |

Note : *1. Pulse Width ≤ 10μs, Duty cycle ≤1%
*2. With each pin mounted on the recommended lands.
*3. Human body model, 1.5kΩ in series with 100pF

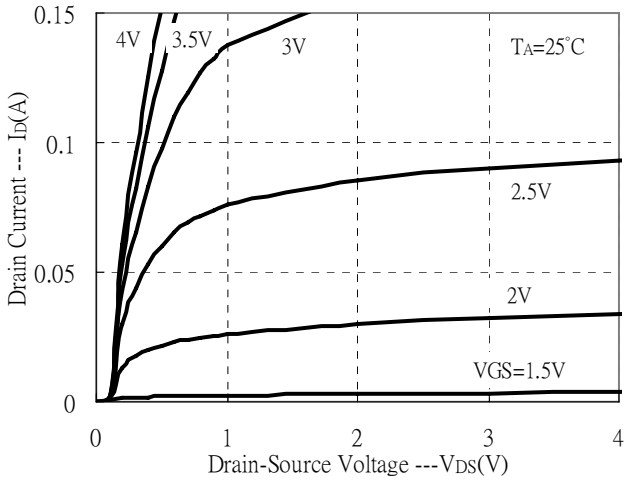
## Electrical Characteristics (Ta=25°C)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| **Static** | | | | | |
| $BV_{DSS}$ | 30 | - | - | V | $V_{GS}$=0, $I_D$=100μA |
| $V_{GS(th)}$ | 0.8 | 1.3 | 1.5 | V | $V_{DS}$=3V, $I_D$=100μA |
| $I_{GSS}$ | - | - | ±1 | μA | $V_{GS}$=±20V, $V_{DS}$=0 |
| $I_{DSS}$ | - | - | 100 | nA | $V_{DS}$=30V, $V_{GS}$=0 |
| $R_{DS(ON)}$ | - | 3.4 | 8 | Ω | $V_{GS}$=4V, $I_D$=10mA |
| | - | 5.7 | 13 | | $V_{GS}$=2.5V, $I_D$=10mA |
| | - | 23 | 30 | | $V_{GS}$=2V, $I_D$=10mA |
| $G_{FS}$ | 20 | 50 | - | mS | $V_{DS}$=3V, $I_D$=10mA |
| **Dynamic** | | | | | |
| $C_{iss}$ | - | 12.5 | - | pF | $V_{DS}$=5V, $V_{GS}$=0, f=1MHz |
| $C_{oss}$ | - | 7.3 | - | | |
| $C_{rss}$ | - | 3.5 | - | | |
| $t_{d(on)}$ | - | 15 | - | ns | $V_{DD}$≒5V, $I_D$=10mA, $V_{GS}$=5V, $R_L$=500Ω, $R_G$=10Ω |
| $t_r$ | - | 35 | - | | |
| $t_{d(off)}$ | - | 75 | - | | |
| $t_f$ | - | 75 | - | | |
| **Source-Drain Diode** | | | | | |
| *$V_{SD}$ | - | 0.88 | 1.2 | V | $V_{GS}$=0V, $I_S$=100mA |

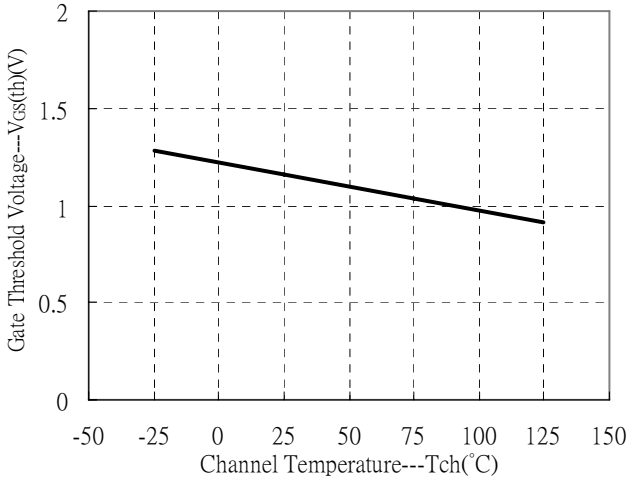
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

## Typical Characteristics

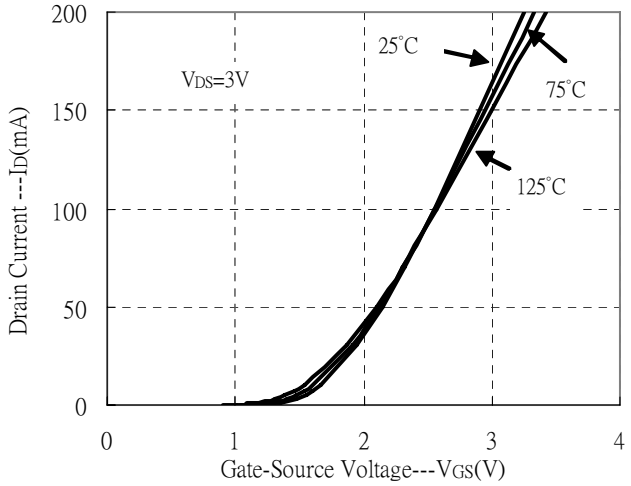
Typical Output Characteristics



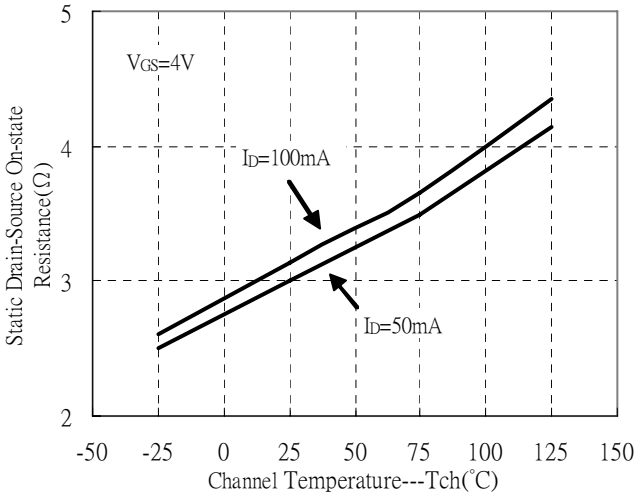

Gate Threshold Voltage vs Channel Temperature



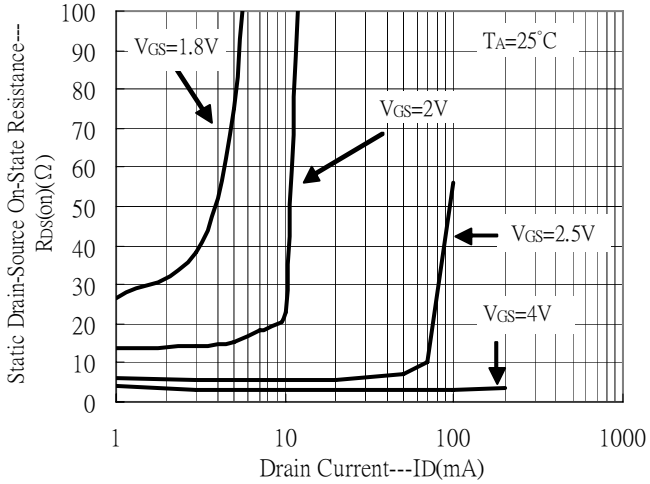

Typical Transfer Characteristics



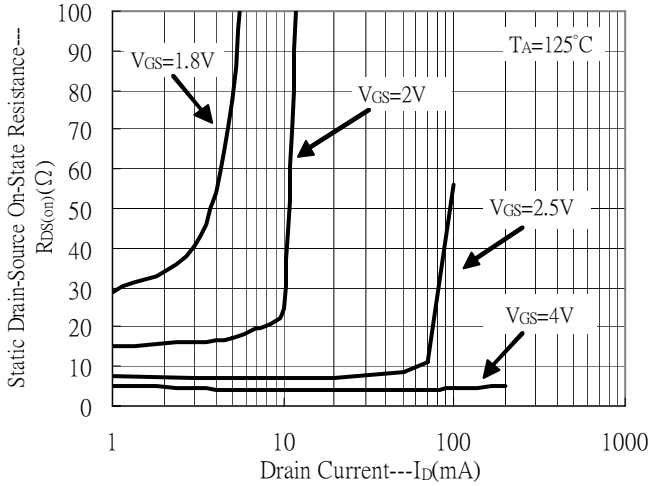

Static Drain-Source On-state Resistance with Temperature




Static Drain-Source On-State resistance vs Drain Current

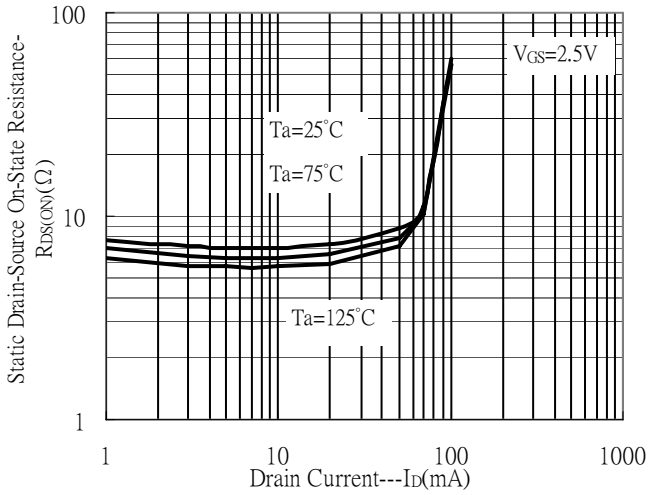



Static Drain-Source On-State resistance vs Drain Current

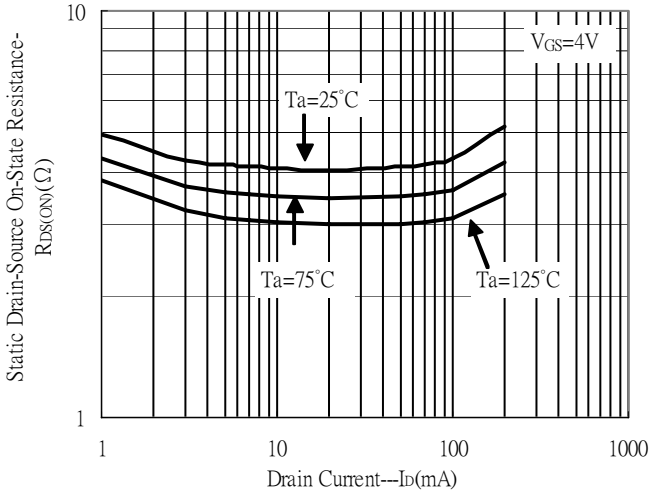


## Typical Characteristics(Cont.)

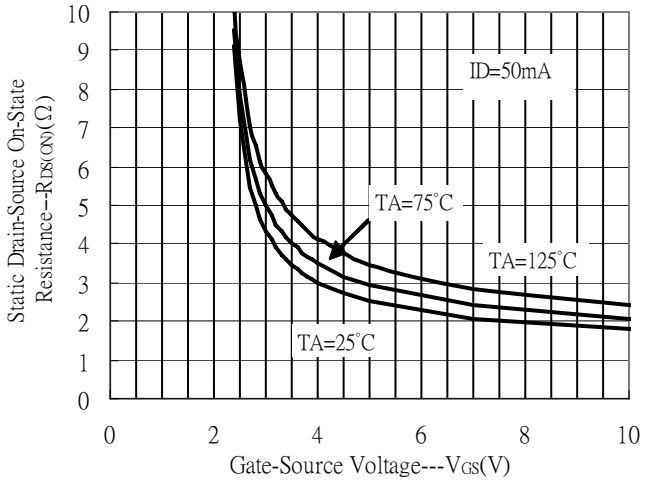
Static Drain-Source On-State Resistance vs Drain Current



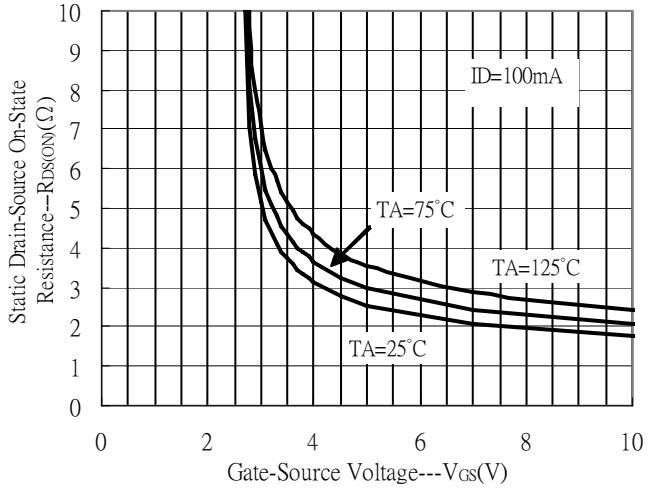

Static Drain-Source On-State Resistance vs Drain Current



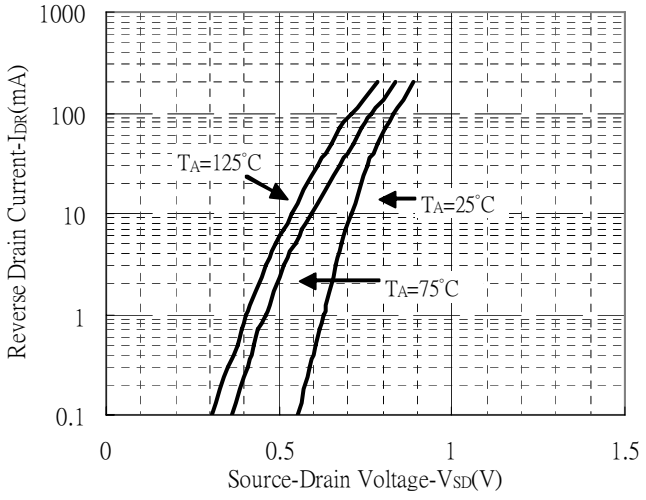

Static Drain-Source On-State Resistance vs Gate-Source Voltage



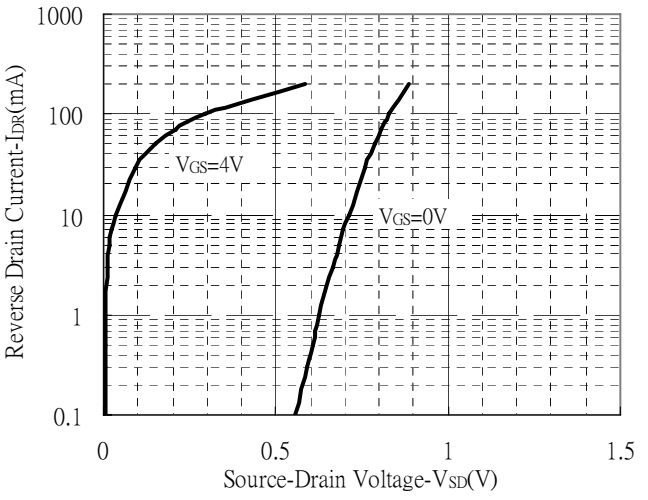

Static Drain-Source On-State Resistance vs Gate-Source Voltage




Reverse Drain Current vs Source-Drain Voltage(I)

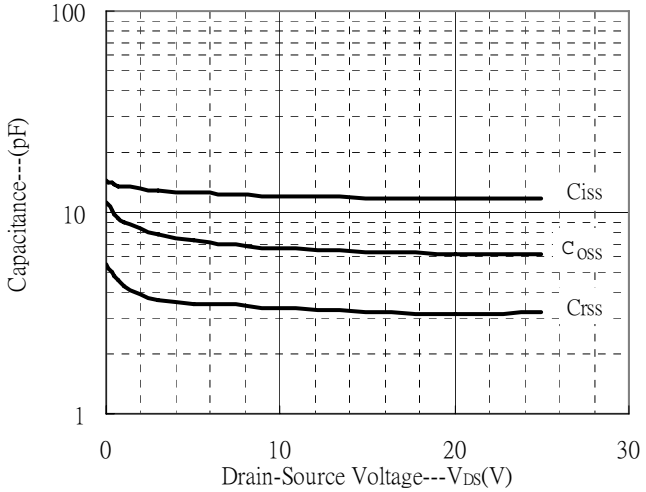



Reverse Drain Current vs Source-Drain Voltage(II)

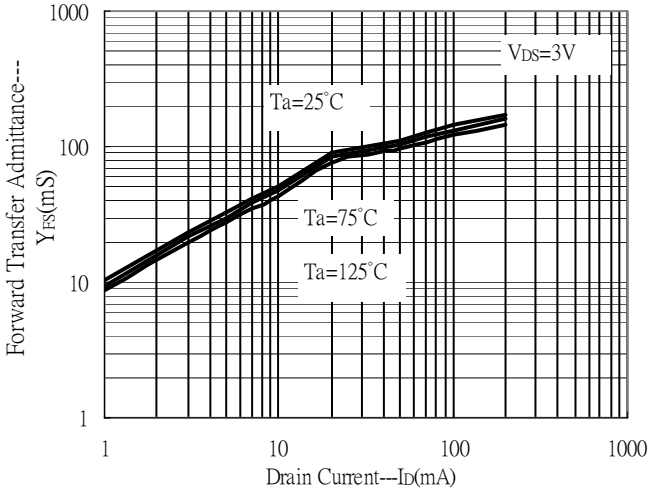


## Typical Characteristics(Cont.)

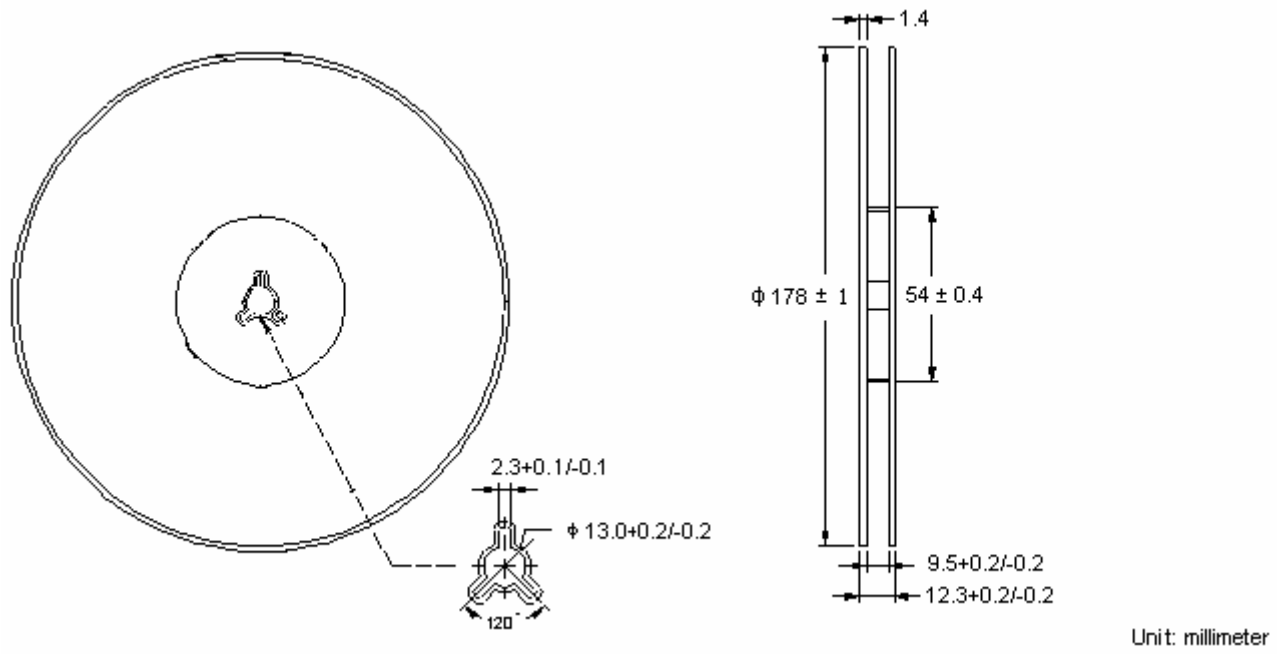
Capacitance vs Drain-to-Source Voltage



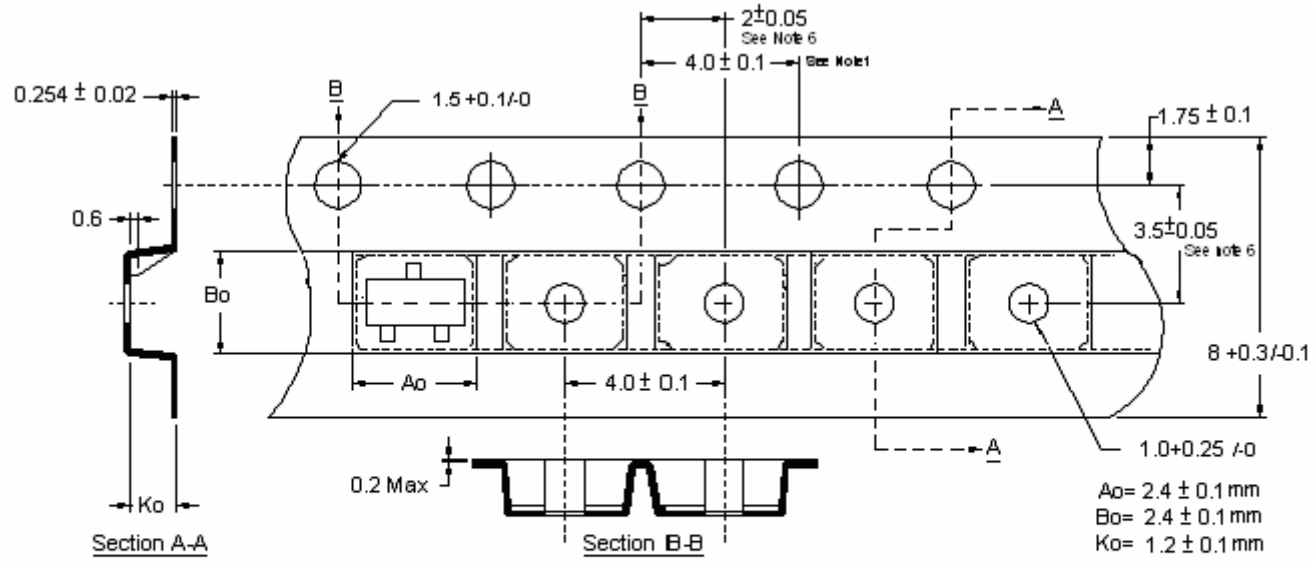

Foreward Transfer Admittance vs Drain Current



## Reel Dimension




## Carrier Tape Dimension



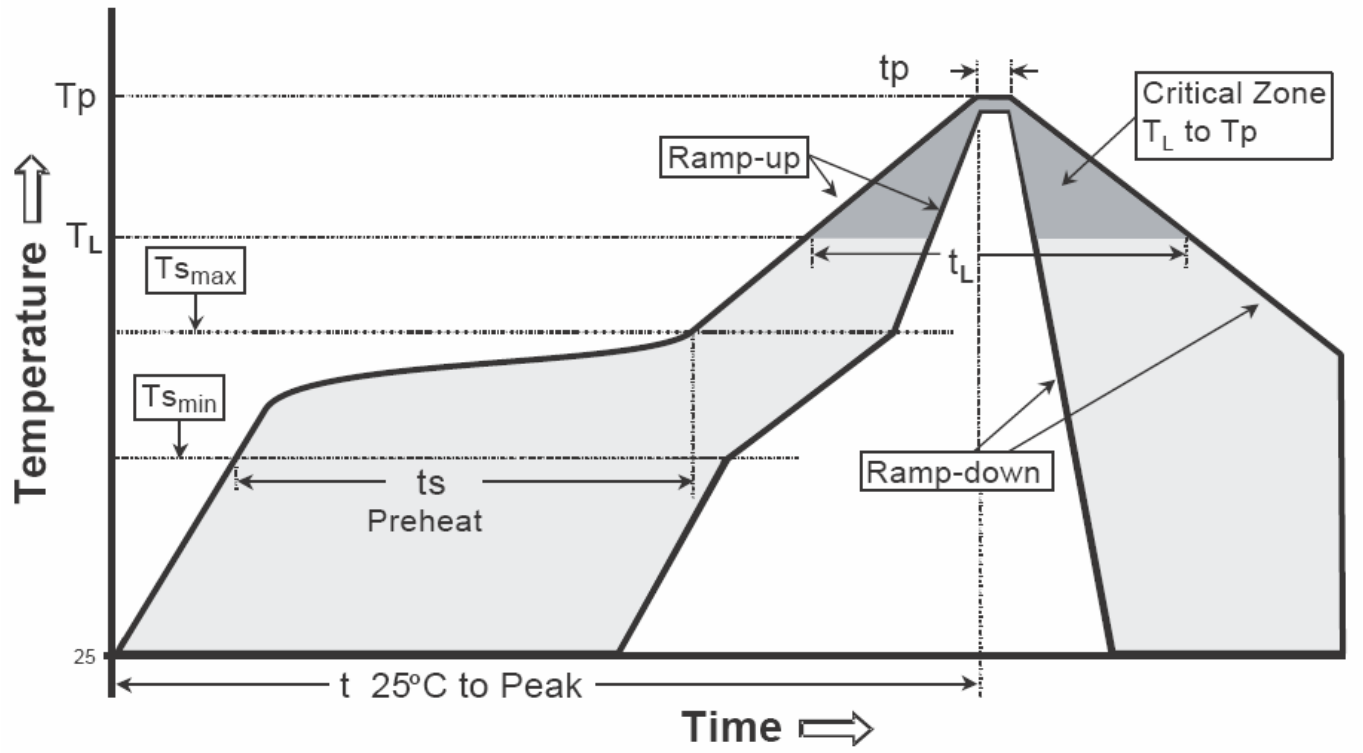

Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

## Recommended wave soldering condition

| Product | Peak Temperature | Soldering Time |
|---|---|---|
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

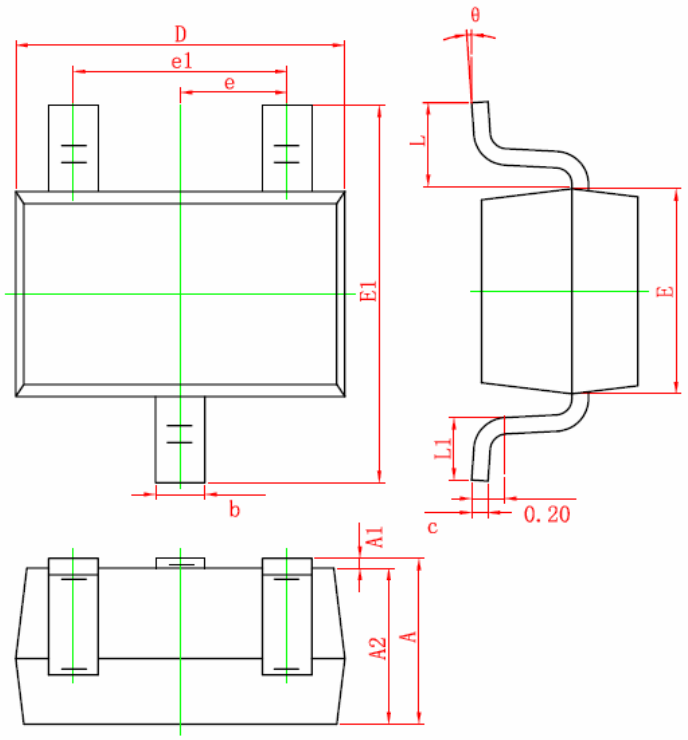
## Recommended temperature profile for IR reflow

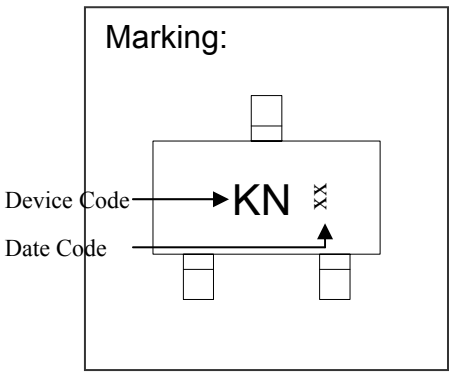



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|---|---|
| Average ramp-up rate (Tsmax to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat<br>−Temperature Min($T_S$ min)<br>−Temperature Max($T_S$ max)<br>−Time($t_{s\ min}$ to $t_{s\ max}$) | <br>100°C<br>150°C<br>60-120 seconds | <br>150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature ($T_L$)<br>− Time ($t_L$) | <br>183°C<br>60-150 seconds | <br>217°C<br>60-150 seconds |
| Peak Temperature($T_P$) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

Note : All temperatures refer to topside of the package, measured on the package body surface.

## SOT-323 Dimension




3-Lead SOT-323 Plastic
Surface Mounted Package
CYStek Package Code: S3

Style: Pin 1.Gate 2.Source 3.Drain

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.043 | E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 | e | 0.650 TYP | | 0.026 TYP | |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 | e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| b | 0.200 | 0.400 | 0.008 | 0.016 | L | 0.525 REF | | 0.021 REF | |
| c | 0.080 | 0.150 | 0.003 | 0.006 | L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| D | 2.000 | 2.200 | 0.079 | 0.087 | θ | 0° | 8° | 0° | 8° |
| E | 1.150 | 1.350 | 0.045 | 0.053 | | | | | |

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.