## P-Channel Enhancement Mode Power MOSFET

# MTE15P06J3

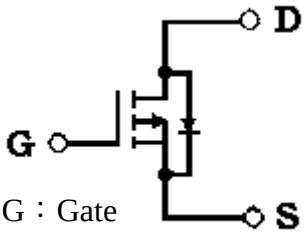
| | |
|---|---|
| **$BV_{DSS}$** | **-60V** |
| **$I_D$ @$V_{GS}$=-10V, $T_C$=25°C** | **-42.5A** |
| **$I_D$ @$V_{GS}$=-10V, $T_A$=25°C** | **-8.5A** |
| **$R_{DS(ON)}$@$V_{GS}$=-10V, $I_D$=-8.5A** | **18mΩ(typ)** |

## Features

- Single Drive Requirement
- Low On-resistance
- Fast switching Characteristic
- Pb-free lead plating and halogen-free package

## Symbol

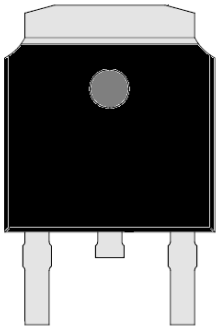
MTE15P06J3




G：Gate
D：Drain
S：Source

## Outline

TO-252(DPAK)



G D S

## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| MTE15P06J3-0-T3-G | TO-252<br>(Pb-free lead plating and halogen-free package) | 2500 pcs / Tape & Reel |

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

Packing spec, T3 : 2500 pcs / tape & reel, 13” reel

Product rank, zero for no rank products

Product name

## Absolute Maximum Ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current @$V_{GS}$=-10V, $T_C$=25°C | | $I_D$ | -42.5 | A |
| Continuous Drain Current @$V_{GS}$=-10V, $T_C$=100°C | | | -26.9 | |
| Continuous Drain Current @$V_{GS}$=-10V, $T_A$=25°C | | | -8.5 | |
| Continuous Drain Current @$V_{GS}$=-10V, $T_A$=100°C | | | -5.4 | |
| Pulsed Drain Current | | $I_{DM}$ | -170 *1 | |
| Single Pulse Avalanche Current @ L=0.5mH | | $I_{AS}$ | -20 | |
| Single Pulse Avalanche Energy @ L=0.5mH, $I_{AS}$=-20A, $V_{DD}$=-50V | | $E_{AS}$ | 100 | mJ |
| Power Dissipation | $T_C$=25℃ | $P_D$ | 62.5 | W |
| | $T_C$=100℃ | | 25 | |
| | $T_A$=25℃ | | 2.5 | |
| | $T_A$=100℃ | | 1.0 | |
| Operating Junction and Storage Temperature | | Tj, Tstg | -55~+150 | °C |

## Thermal Data

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-case, max | $R_{\theta JC}$ | 2 | °C/W |
| Thermal Resistance, Junction-to-ambient, max | $R_{\theta JA}$ | 50 *2 | |

Note : *1. Pulse width limited by safe operating area.

*2 . The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with $T_A$=25°C. The value in any given application depends on the user's specific board design.

*3 . The power dissipation $P_D$ is more useful in setting the upper dissipation limit for cases where additional heatsinking is used. It is used to determined the current rating, when this rating falls below the package limit.

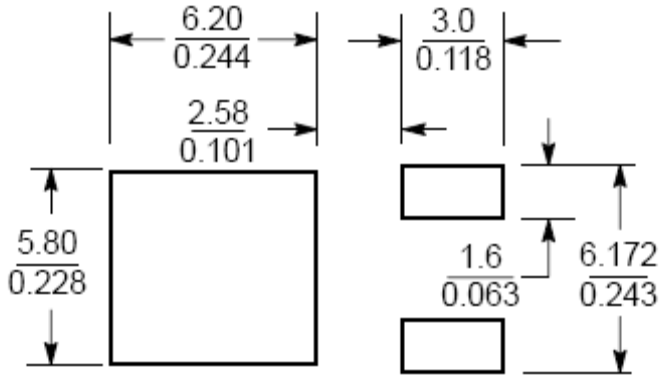
## Characteristics (Tj=25°C, unless otherwise specified)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| **Static** | | | | | |
| $BV_{DSS}$ | -60 | - | - | V | $V_{GS}$=0V, $I_D$=-250μA |
| $V_{GS(th)}$ | -2 | - | -4 | | $V_{DS}$ = $V_{GS}$, $I_D$=-250μA |
| $G_{FS}$ | - | 22.9 | - | S | $V_{DS}$ =-10V, $I_D$=-20A |
| $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$=±20V, $V_{DS}$=0V |
| $I_{DSS}$ | - | - | -1 | μA | $V_{DS}$ =-48V, $V_{GS}$ =0V |
| | - | - | -25 | | $V_{DS}$ =-48V, $V_{GS}$ =0V, Tj=70°C |
| *$R_{DS(ON)}$ | - | 18 | 23.5 | mΩ | $V_{GS}$ =-10V, $I_D$=-8.5A |
| **Dynamic** | | | | | |
| *Qg | - | 38.4 | - | nC | $I_D$=-17A, $V_{DS}$=-48V, $V_{GS}$=-10V |
| *Qgs | - | 8.1 | - | | |
| *Qgd | - | 12.5 | - | | |

| | | | | | |
|---|---|---|---|---|---|
| *$t_{d(ON)}$ | - | 15.6 | - | ns | $V_{DS}$=-30V, $V_{GS}$=-10V, $R_G$=1Ω, $I_D$=-17A |
| *tr | - | 25 | - | | |
| *$t_{d(OFF)}$ | - | 54.2 | - | | |
| *$t_f$ | - | 19.6 | - | | |
| Ciss | - | 2071 | - | pF | $V_{GS}$=0V, $V_{DS}$=-30V, f=1MHz |
| Coss | - | 276 | - | | |
| Crss | - | 117 | - | | |
| **Source-Drain Diode** | | | | | |
| * $I_S$ | - | - | -42.5 | A | |
| *$I_{SM}$ | - | - | -170 | | |
| *$V_{SD}$ | - | -0.83 | -1.2 | V | $I_S$=-17A, $V_{GS}$=0V |
| *trr | - | 18 | - | ns | $I_F$=-17A, $V_{GS}$=0V, $dI_F/dt$=100A/μs |
| *Qrr | - | 11.3 | - | nC | |

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

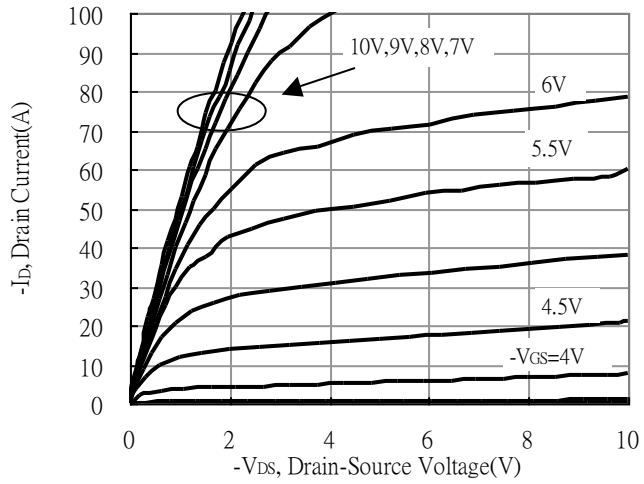
## Recommended soldering footprint



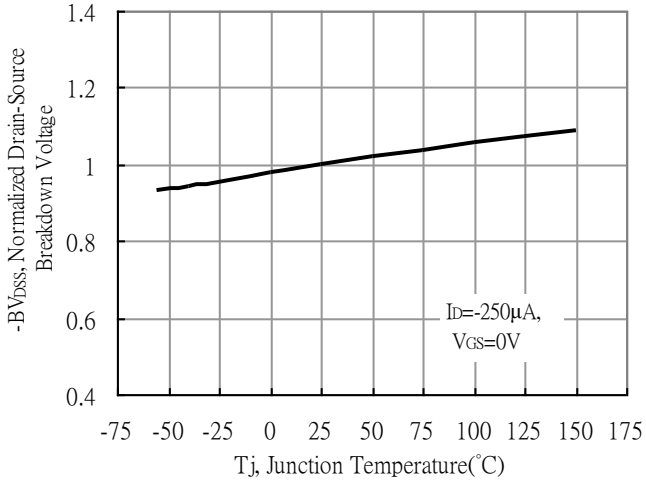

Unit ( mm / inch )

## Typical Characteristics

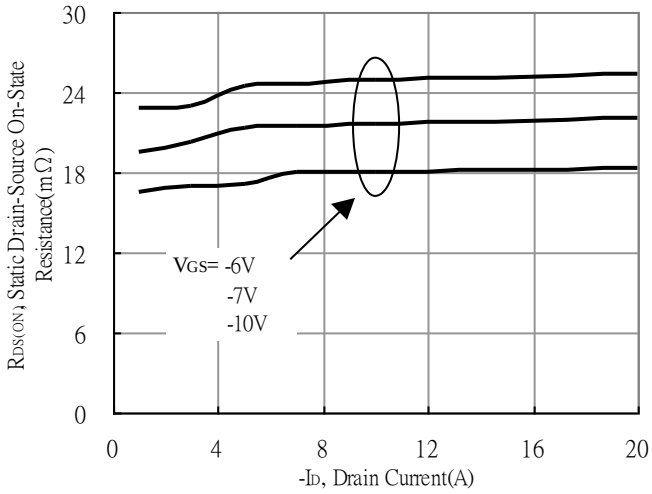
Typical Output Characteristics



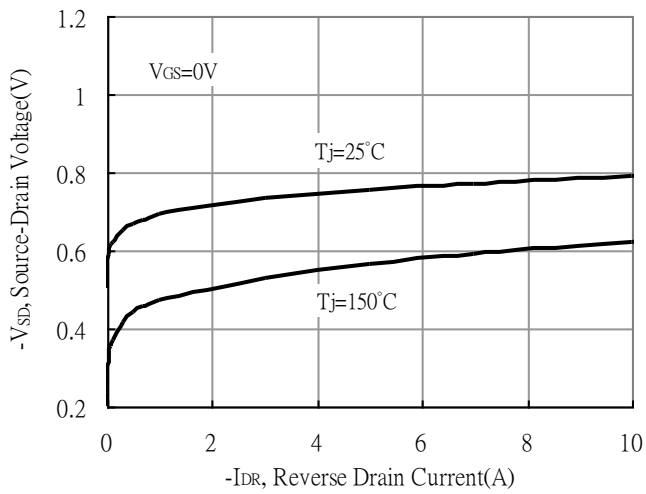

Brekdown Voltage vs Ambient Temperature



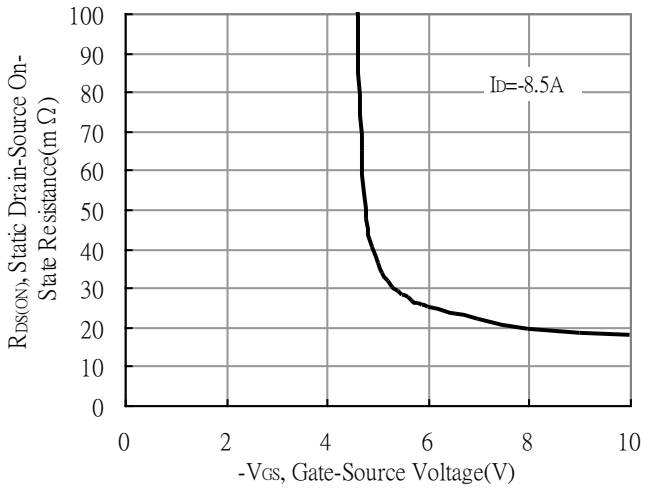

Static Drain-Source On-State resistance vs Drain Current



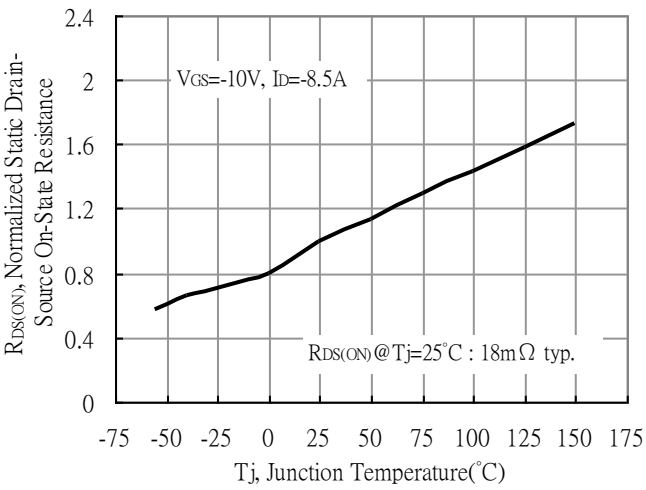

Reverse Drain Current vs Source-Drain Voltage




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

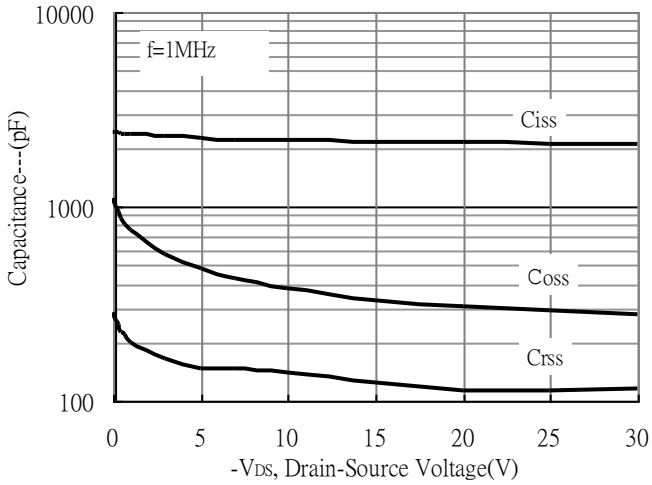



Drain-Source On-State Resistance vs Junction Tempearture

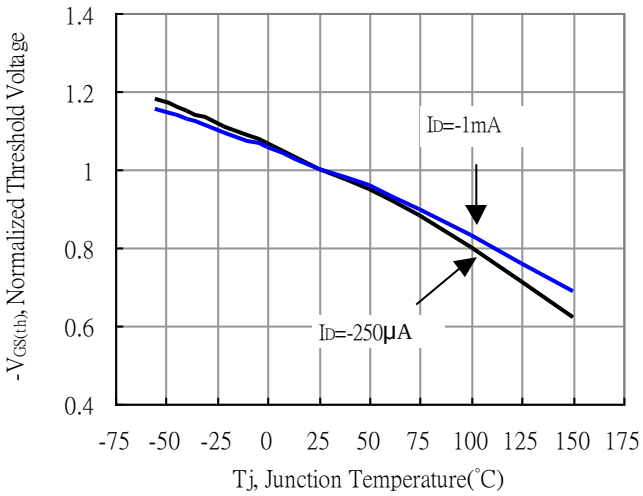


## Typical Characteristics(Cont.)

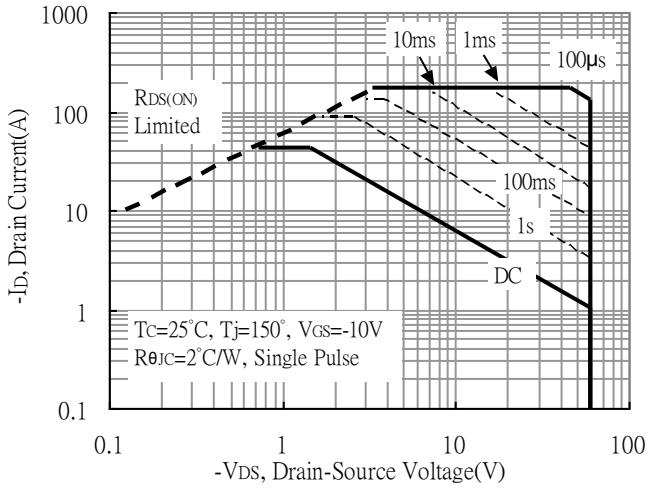
Capacitance vs Drain-to-Source Voltage



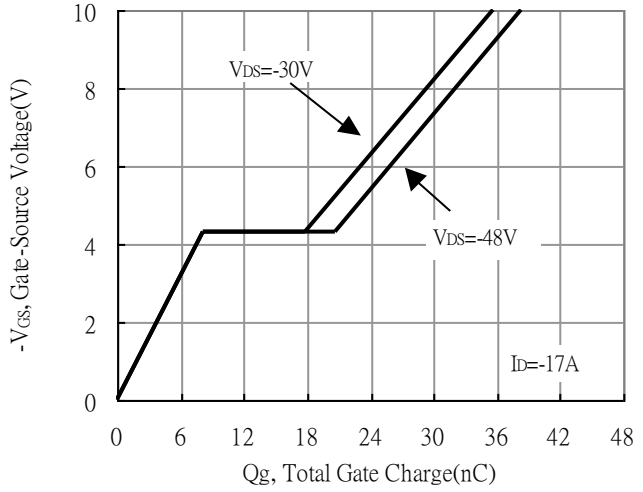

Threshold Voltage vs Junction Tempearture



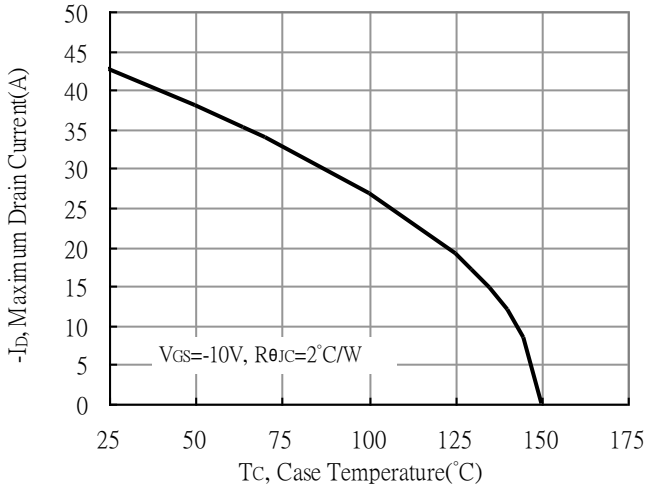

Maximum Safe Operating Area



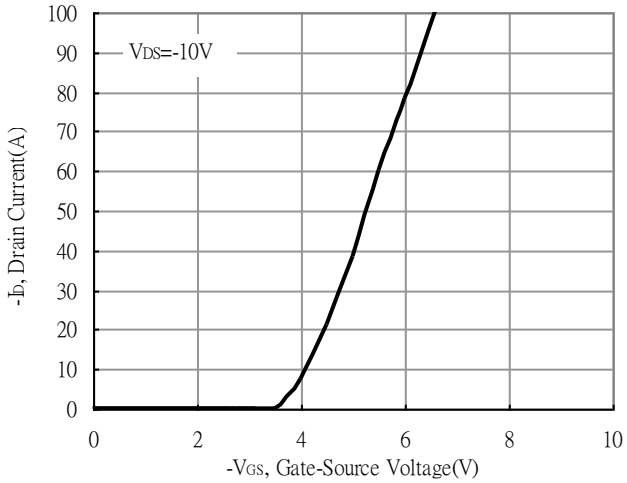

Gate Charge Characteristics




Maximum Drain Current vs Case Temperature

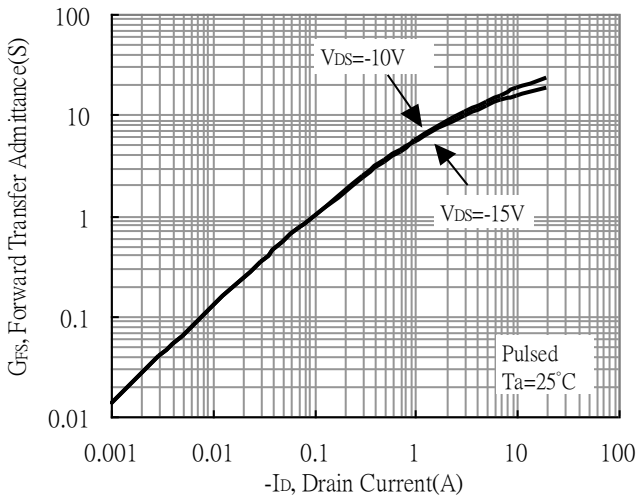



Typical Transfer Characteristics

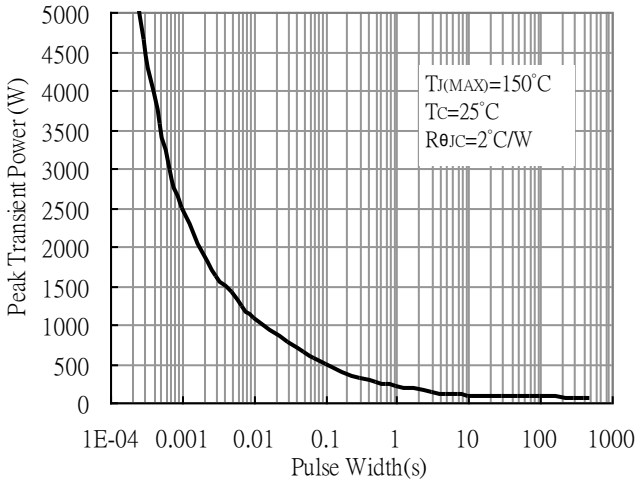


## Typical Characteristics(Cont.)

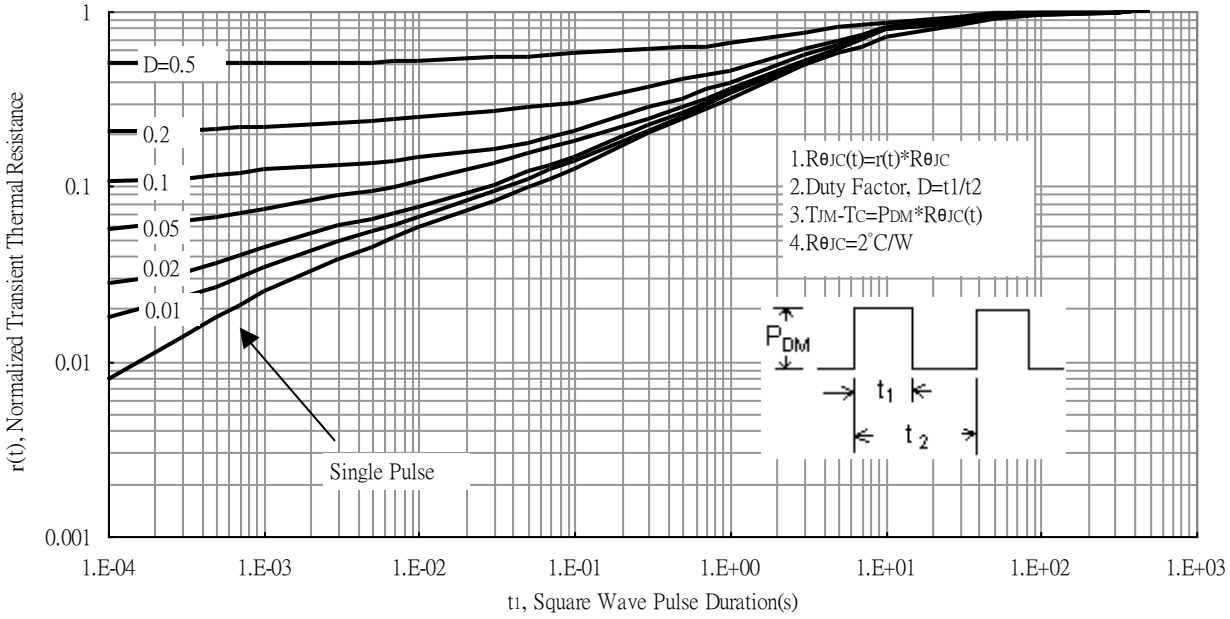
Forward Transfer Admittance vs Drain Current



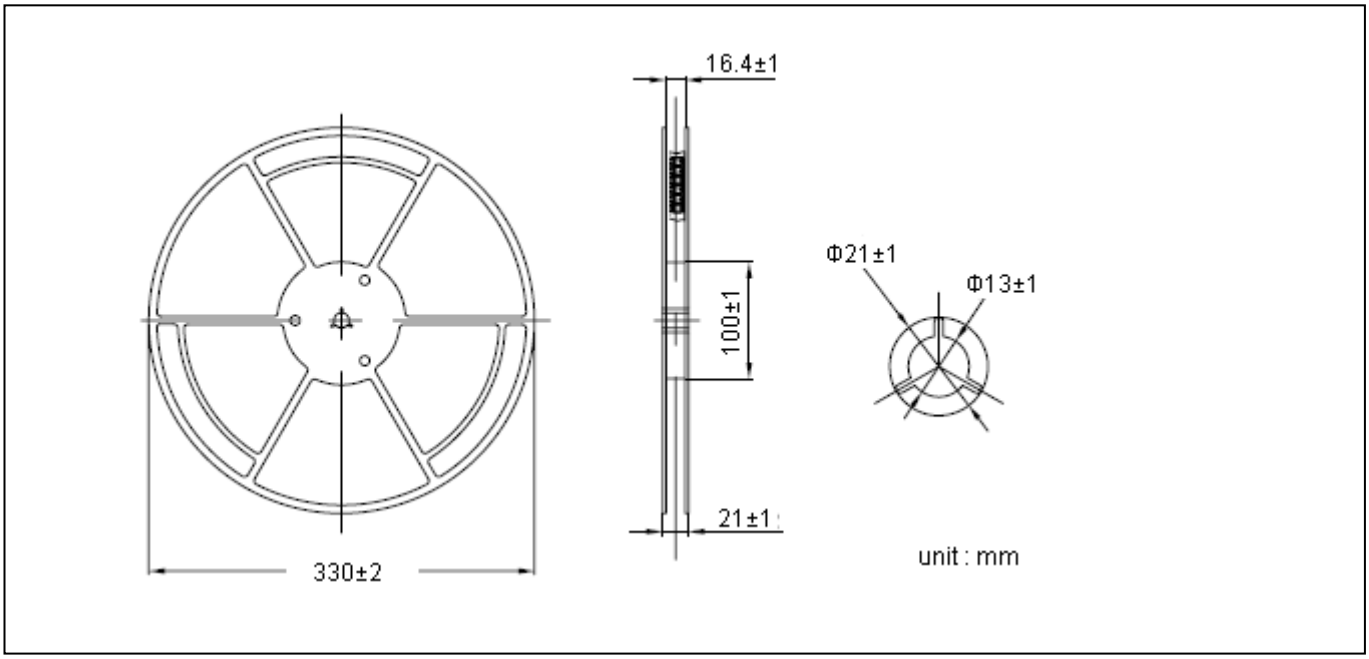

Single Pulse Maximum Power Dissipation



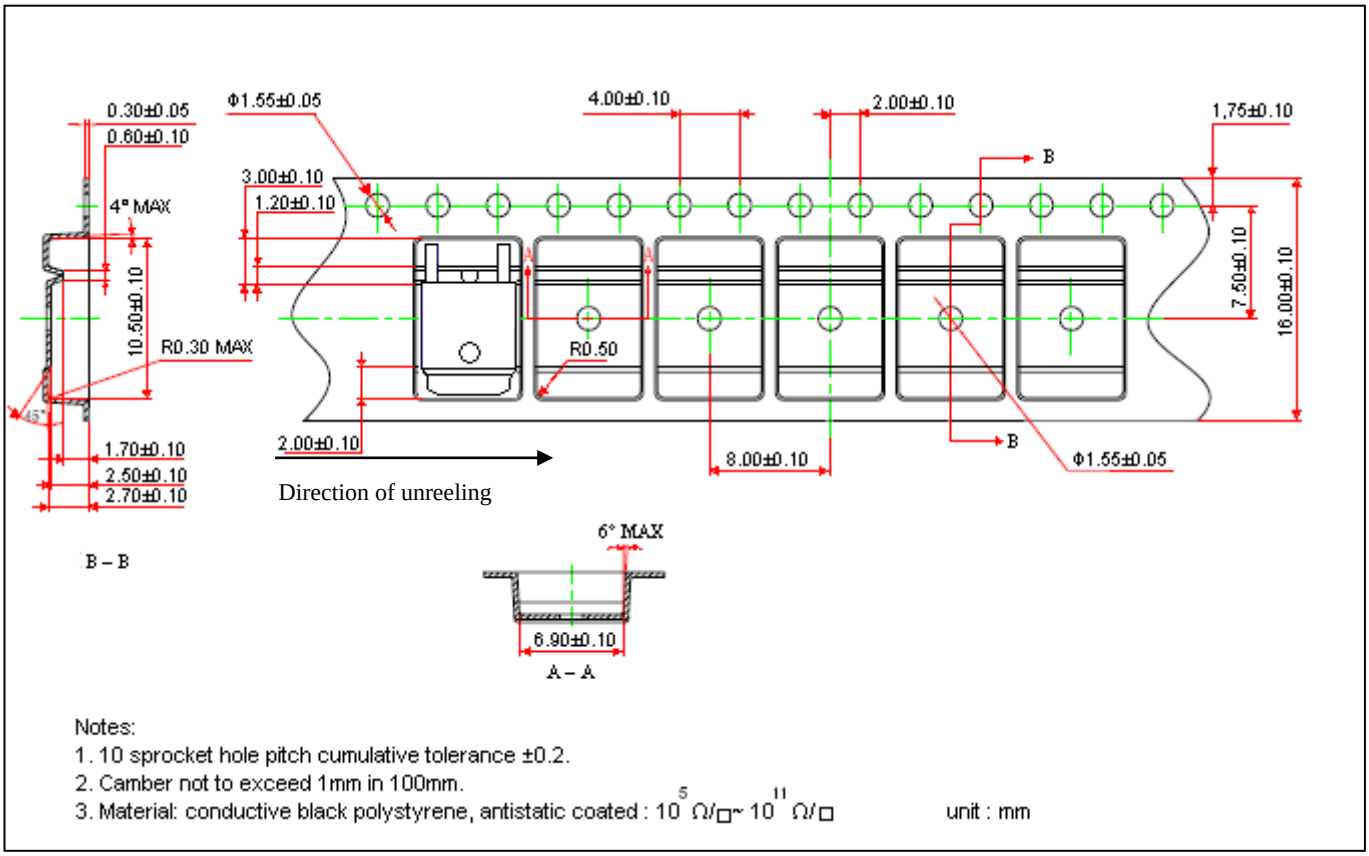

Transient Thermal Response Curves



## Reel Dimension



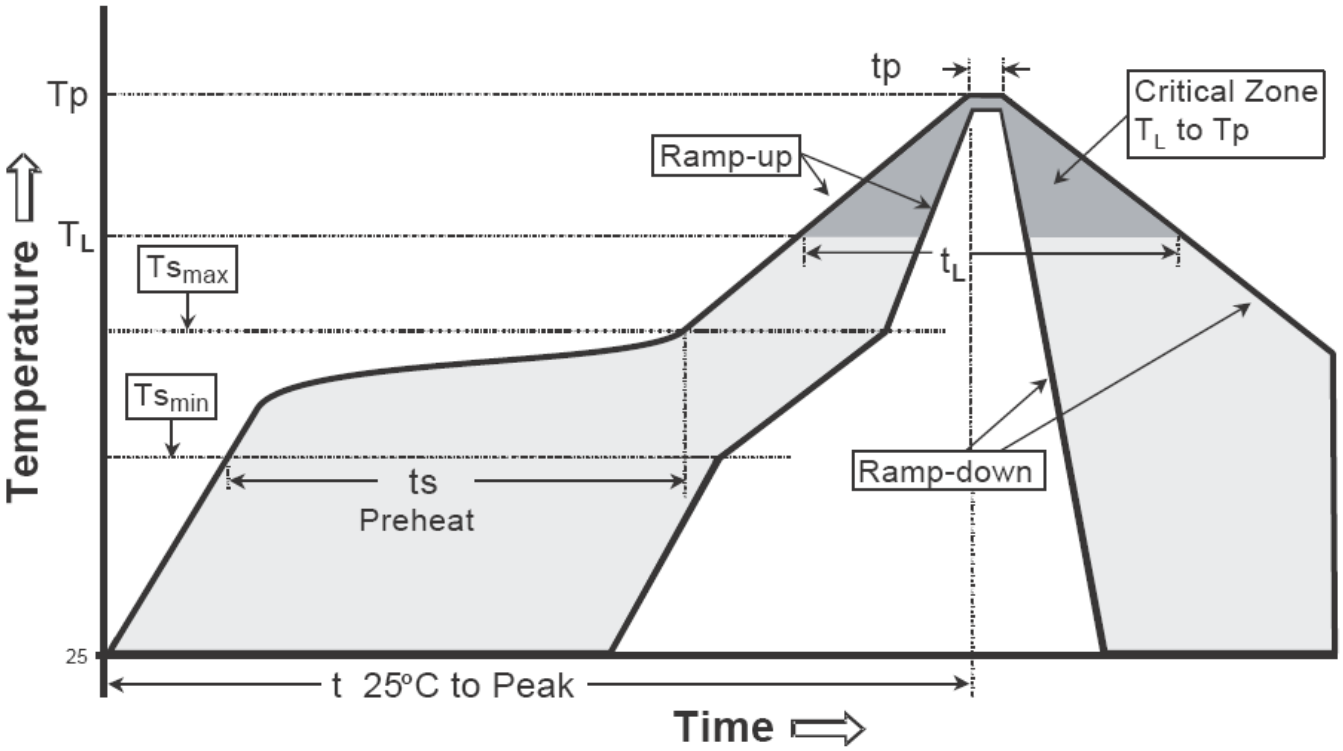

## Carrier Tape Dimension



## Recommended wave soldering condition

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

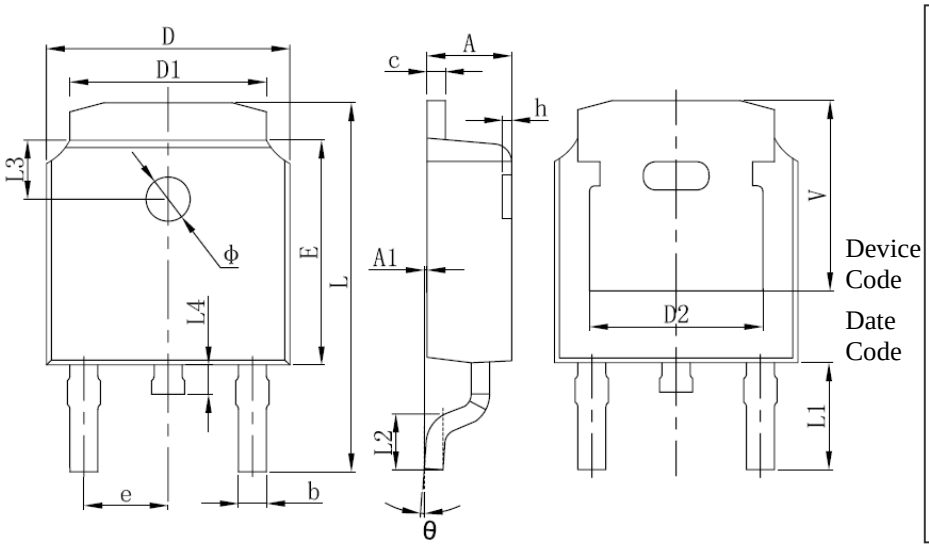
## Recommended temperature profile for IR reflow

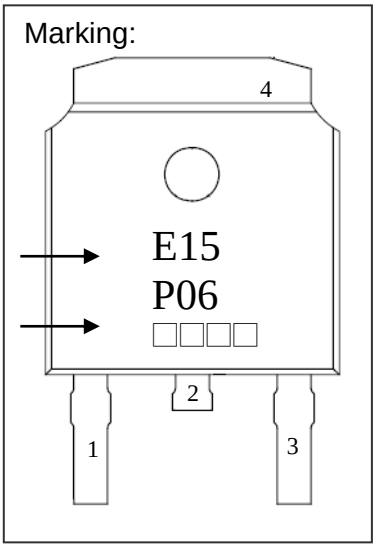



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|---|---|
| Average ramp-up rate (Tsmax to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat<br>−Temperature Min(Ts min)<br>−Temperature Max(Ts max)<br>−Time(ts min to ts max) | <br>100°C<br>150°C<br>60-120 seconds | <br>150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature (TL)<br>− Time (tL) | <br>183°C<br>60-150 seconds | <br>217°C<br>60-150 seconds |
| Peak Temperature(TP) | 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.

## TO-252 Dimension




3-Lead TO-252 Plastic Surface Mount Package
CYStek Package Code: J3

Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

Date Code :
First Code : Last digit of Christian Year
Second Code : Month Code : Jan→A, Feb→B, Mar→C, Apr→D, May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct→K, Nov→L, Dec→M
Last Two Codes : Production Serial Code, 01~99

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.087 | 0.094 | 2.200 | 2.400 | L | 0.382 | 0.406 | 9.712 | 10.312 |
| A1 | 0.000 | 0.005 | 0.000 | 0.127 | L1 | 0.114 REF | | 2.900 REF | |
| b | 0.025 | 0.030 | 0.635 | 0.770 | L2 | 0.055 | 0.067 | 1.400 | 1.700 |
| c | 0.018 | 0.023 | 0.460 | 0.580 | L3 | 0.063 REF | | 1.600 REF | |
| D | 0.256 | 0.264 | 6.500 | 6.700 | L4 | 0.024 | 0.039 | 0.600 | 1.000 |
| D1 | 0.201 | 0.215 | 5.100 | 5.460 | Φ | 0.043 | 0.051 | 1.100 | 1.300 |
| D2 | 0.190 REF | | 4.830 REF | | θ | 0° | 8° | 0° | 8° |
| E | 0.236 | 0.244 | 6.000 | 6.200 | h | 0.000 | 0.012 | 0.000 | 0.300 |
| e | 0.086 | 0.094 | 2.186 | 2.386 | v | 0.207 REF | | 5.250 REF | |

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.