

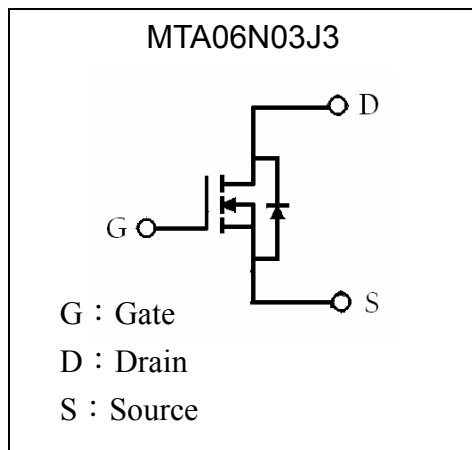
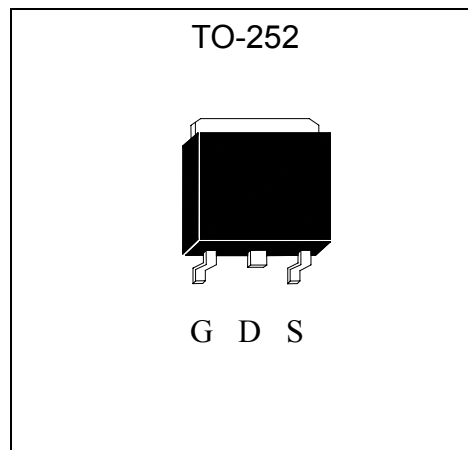
N-Channel Enhancement Mode Power MOSFET

MTA06N03J3

| | |
|--------------|-------------|
| BV_{DSS} | 25V |
| I_D | 80A |
| $R_{DS(ON)}$ | 6m Ω |

Features

- 100% UIS testing, @ $V_D=15V$, $L=0.1mH$, $V_G=10V$, $I_L=40V$, rated $V_{DS}=25V$ N-CH
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package & Halogen-free package

Symbol

Outline

Absolute Maximum Ratings ($T_c=25^\circ C$, unless otherwise noted)

| Parameter | Symbol | Limits | Unit |
|---|----------------|----------|------------|
| Drain-Source Voltage | V_{DS} | 25 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | |
| Continuous Drain Current @ $T_c=25^\circ C$ | I_D | 80 | A |
| Continuous Drain Current @ $T_c=100^\circ C$ | I_D | 50 | |
| Pulsed Drain Current (Note 1) | I_{DM} | 170 | |
| Avalanche Current | I_{AS} | 53 | |
| Avalanche Energy @ $L=0.1mH$, $I_D=53A$, $R_G=25\Omega$ | E_{AS} | 140 | mJ |
| Repetitive Avalanche Energy @ $L=0.05mH$ (Note 2) | E_{AR} | 40 | |
| Total Power Dissipation @ $T_c=25^\circ C$ | P_d | 83 | W |
| Total Power Dissipation @ $T_c=100^\circ C$ | | 45 | |
| Operating Junction and Storage Temperature Range | T_j, T_{stg} | -55~+175 | $^\circ C$ |

Note : 1. Pulse width limited by maximum junction temperature
 2. Duty cycle $\leq 1\%$



Thermal Data

| Parameter | Symbol | Value | Unit |
|--|--------------|-------|------|
| Thermal Resistance, Junction-to-case, max | $R_{th,j-c}$ | 1.8 | °C/W |
| Thermal Resistance, Junction-to-ambient, max | $R_{th,j-a}$ | 75 | °C/W |

Characteristics (Tc=25°C, unless otherwise specified)

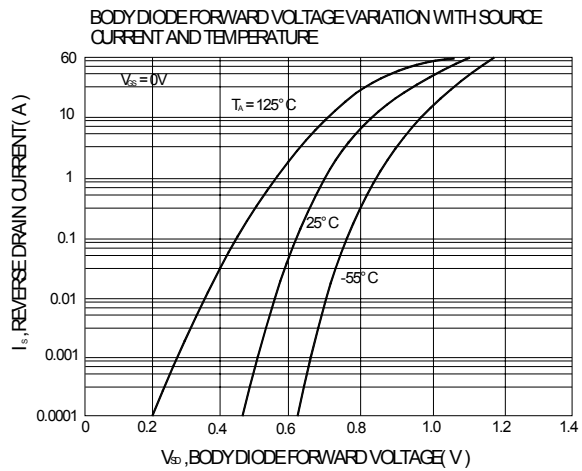
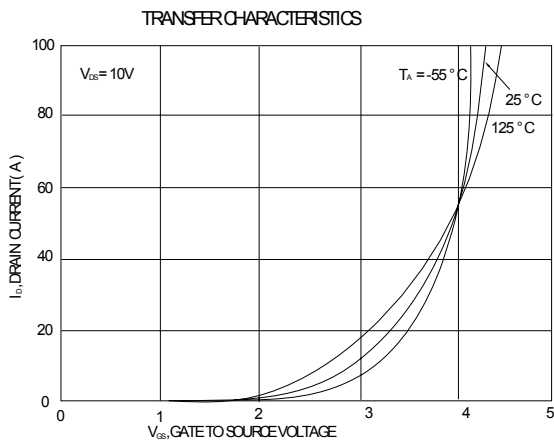
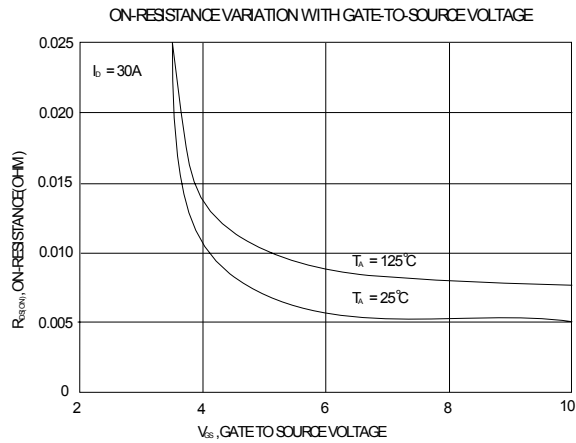
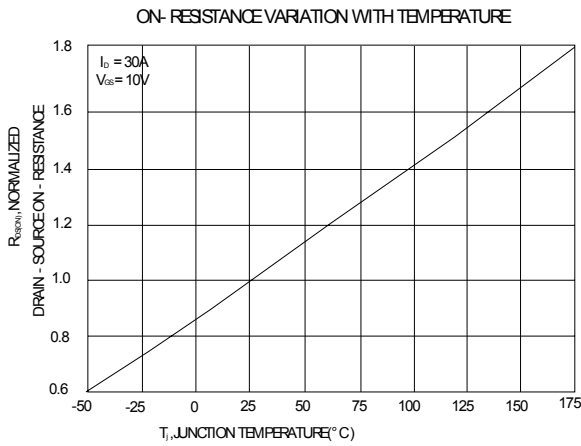
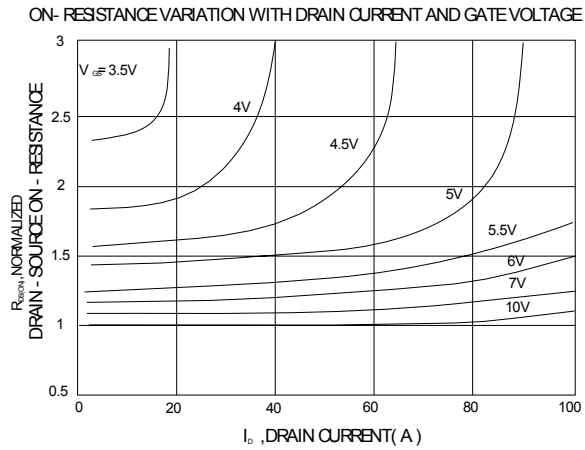
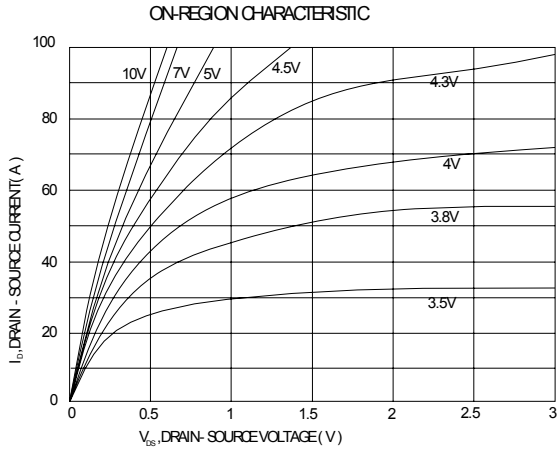
| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---------------------------|------|------|------|-----------|---|
| Static | | | | | |
| BV_{DSS} | 25 | - | - | V | $V_{GS}=0V, I_D=250\mu A$ |
| $V_{GS(th)}$ | 1 | 1.5 | 3 | V | $V_{DS} = V_{GS}, I_D=250\mu A$ |
| I_{GSS} | - | - | ±100 | nA | $V_{GS}=\pm 20, V_{DS}=0V$ |
| I_{DSS} | - | - | 1 | μA | $V_{DS} = 20V, V_{GS} = 0V$ |
| | - | - | 25 | | $V_{DS} = 20V, V_{GS} = 0V, T_j=125^\circ C$ |
| * $I_{D(ON)}$ | 80 | - | - | A | $V_{DS} = 10V, V_{GS} = 10V$ |
| * $R_{DS(ON)}$ | - | 5.3 | 6 | $m\Omega$ | $V_{GS} = 10V, I_D=30A$ |
| | - | 7.6 | 9.5 | | $V_{GS} = 5V, I_D=24A$ |
| * G_{FS} | - | 25 | - | S | $V_{DS} = 5V, I_D=24A$ |
| Dynamic | | | | | |
| * $Q_g(V_{GS}=10V)$ | - | 53 | - | nC | $I_D=30A, V_{DS}=15V, V_{GS}=10V$ |
| * $Q_g(V_{GS}=5V)$ | - | 30 | - | | |
| * Q_{gs} | - | 8 | - | | |
| * Q_{gd} | - | 17 | - | | |
| * $t_{d(ON)}$ | - | 22 | - | ns | $V_{DS}=15V, I_D=25A, V_{GS}=10V, R_{GS}=2.7\Omega$ |
| * t_r | - | 16 | - | | |
| * $t_{d(OFF)}$ | - | 65 | - | | |
| * t_f | - | 10 | - | | |
| C_{iss} | - | 4840 | - | pF | $V_{GS}=0V, V_{DS}=15V, f=1MHz$ |
| C_{oss} | - | 620 | - | | |
| C_{rSS} | - | 435 | - | | |
| R_g | - | 1.2 | - | Ω | $V_{GS}=15mV, V_{DS}=0V, f=1MHz$ |
| Source-Drain Diode | | | | | |
| * I_S | - | - | 80 | A | |
| * I_{SM} | - | - | 170 | | |
| * V_{SD} | - | - | 1.3 | V | $I_F=I_S, V_{GS}=0V$ |
| * t_{rr} | - | 32 | - | ns | $I_F=I_S, V_{GS}=0, dI_F/dt=100A/\mu s$ |
| * Q_{rr} | - | 12 | - | nC | |

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

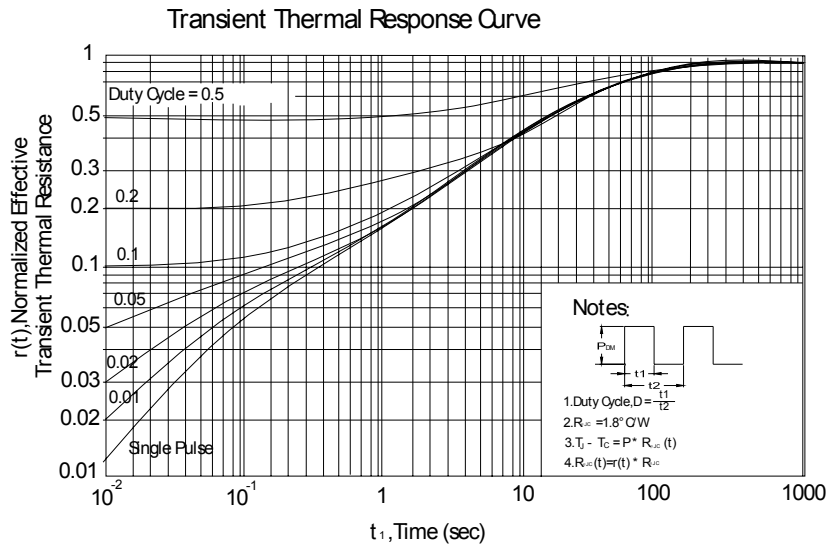
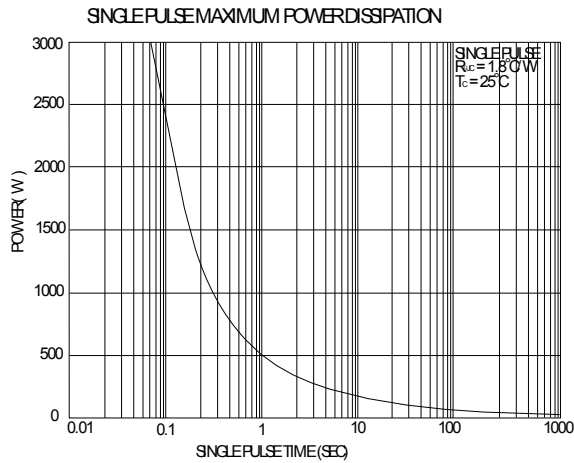
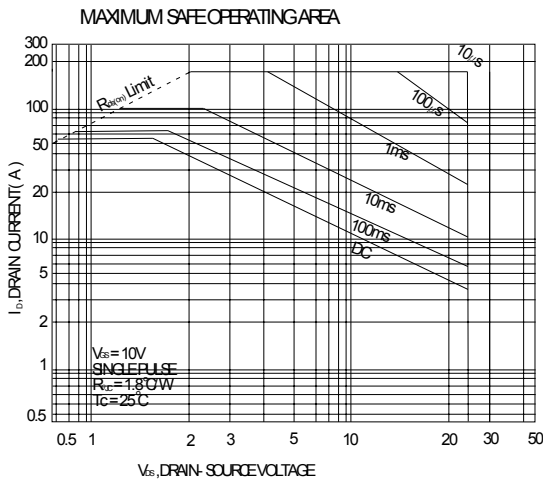
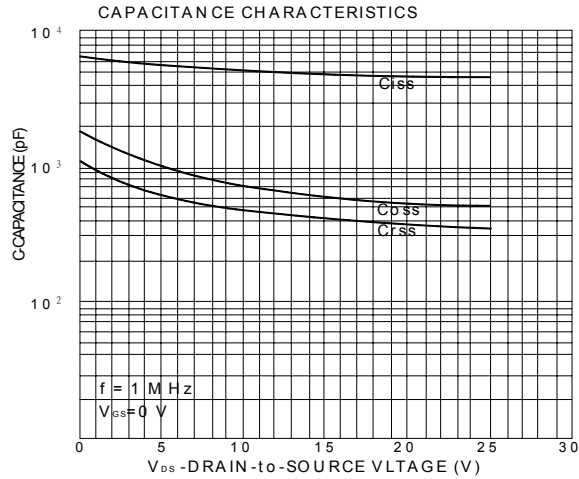
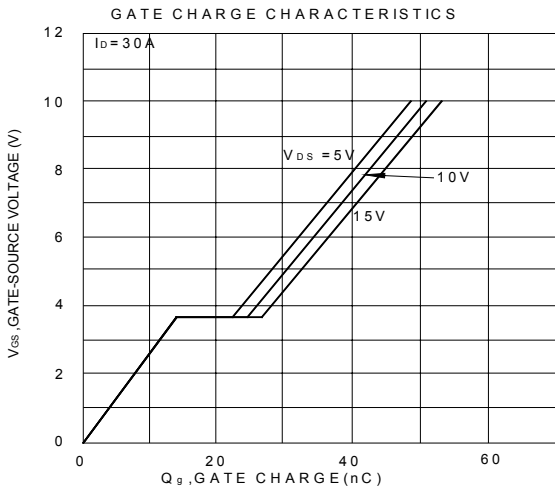
Ordering Information

| Device | Package | Shipping | Marking |
|------------|---|------------------------|---------|
| MTA06N03J3 | TO-252 (RoHS compliant & Halogen-free) | 2500 pcs / Tape & Reel | A06N03 |

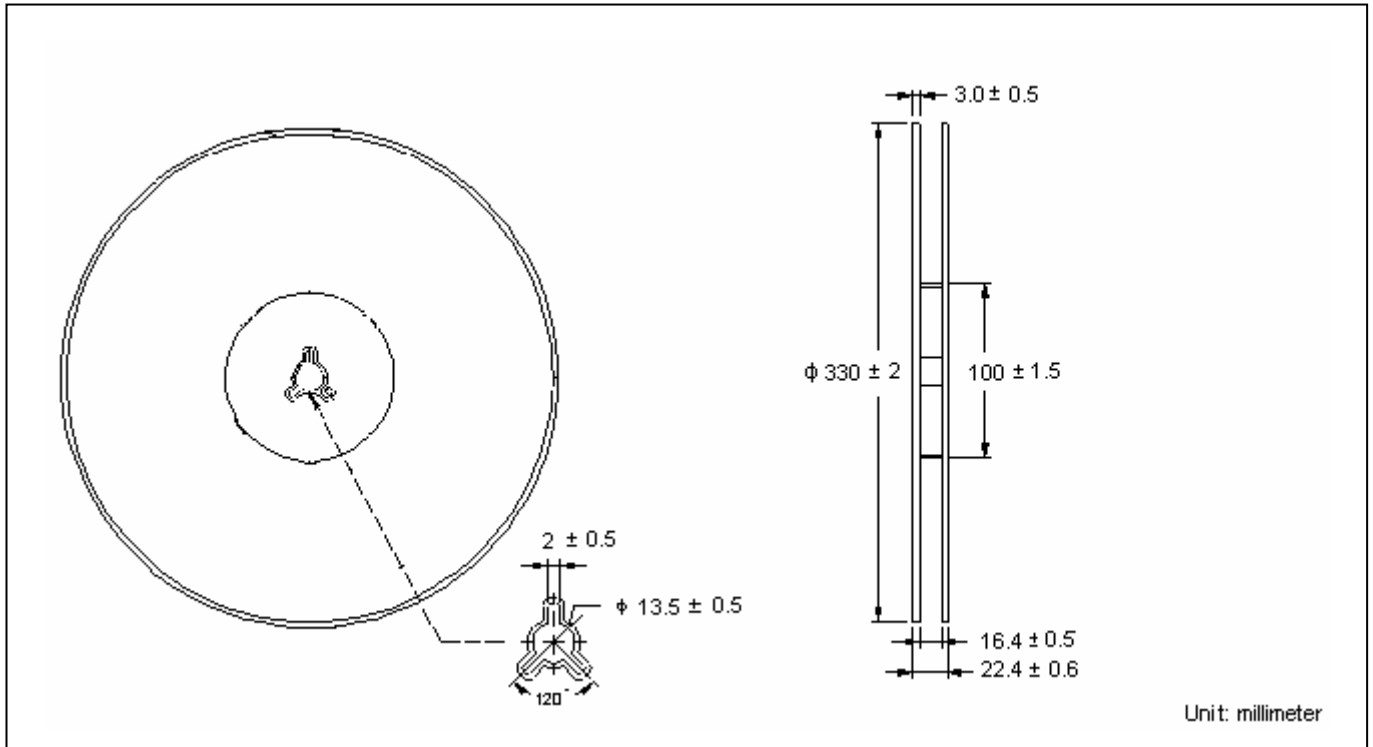
Characteristic Curves



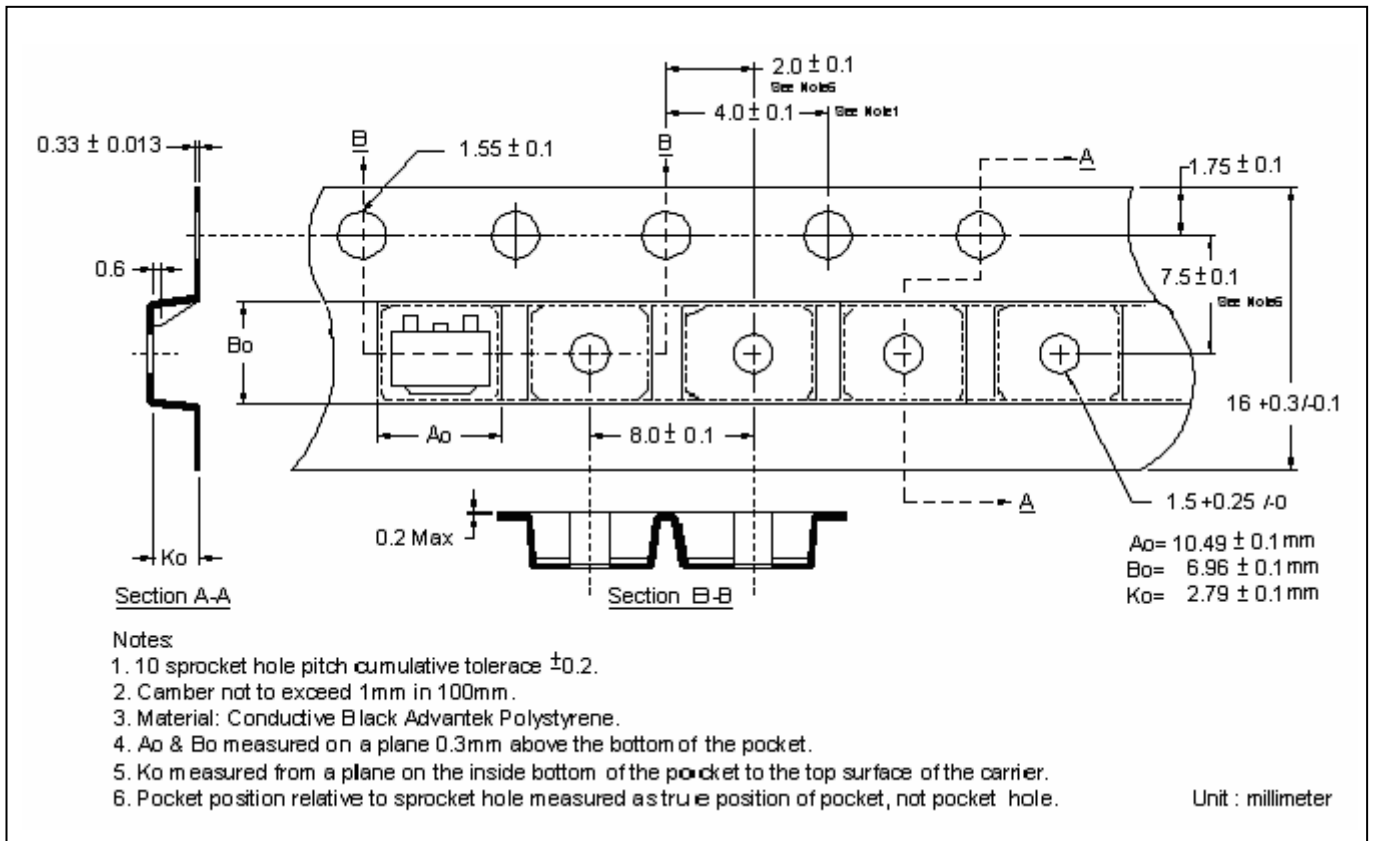
Characteristic Curves(Cont.)



Reel Dimension



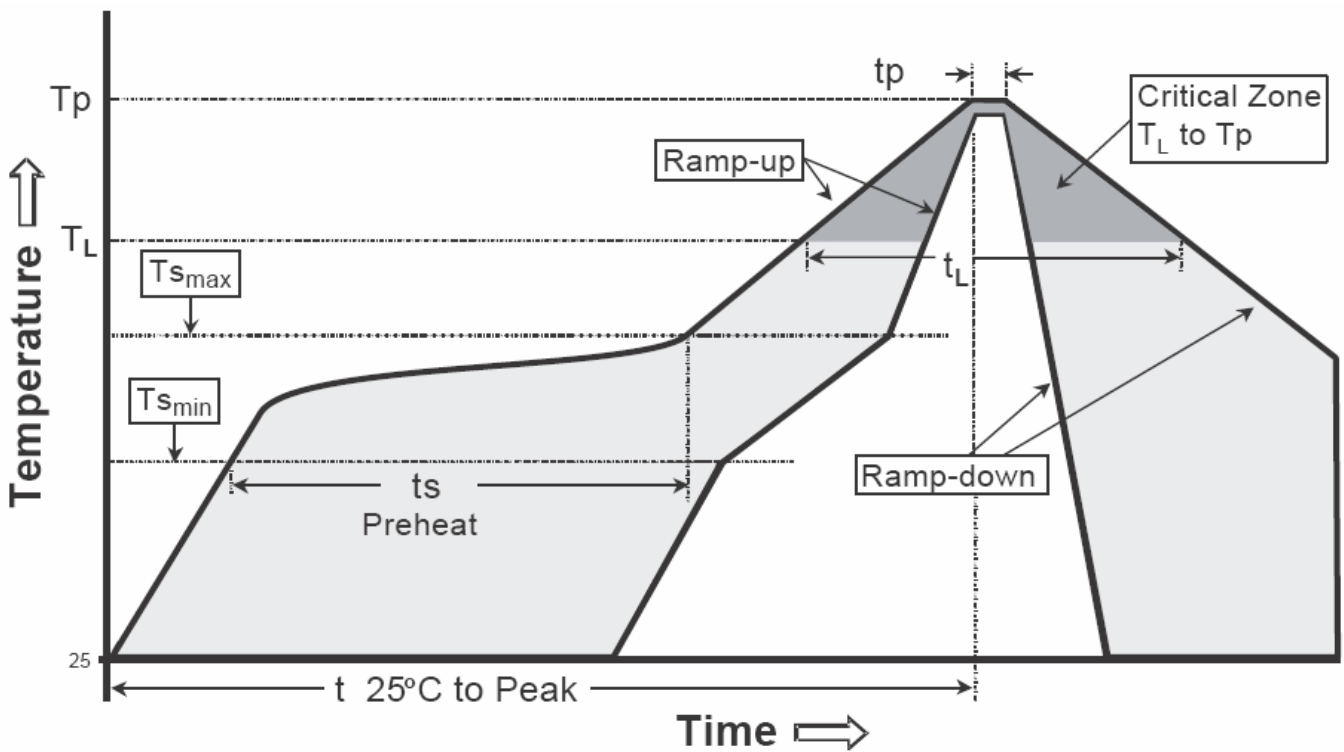
Carrier Tape Dimension



Recommended wave soldering condition

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

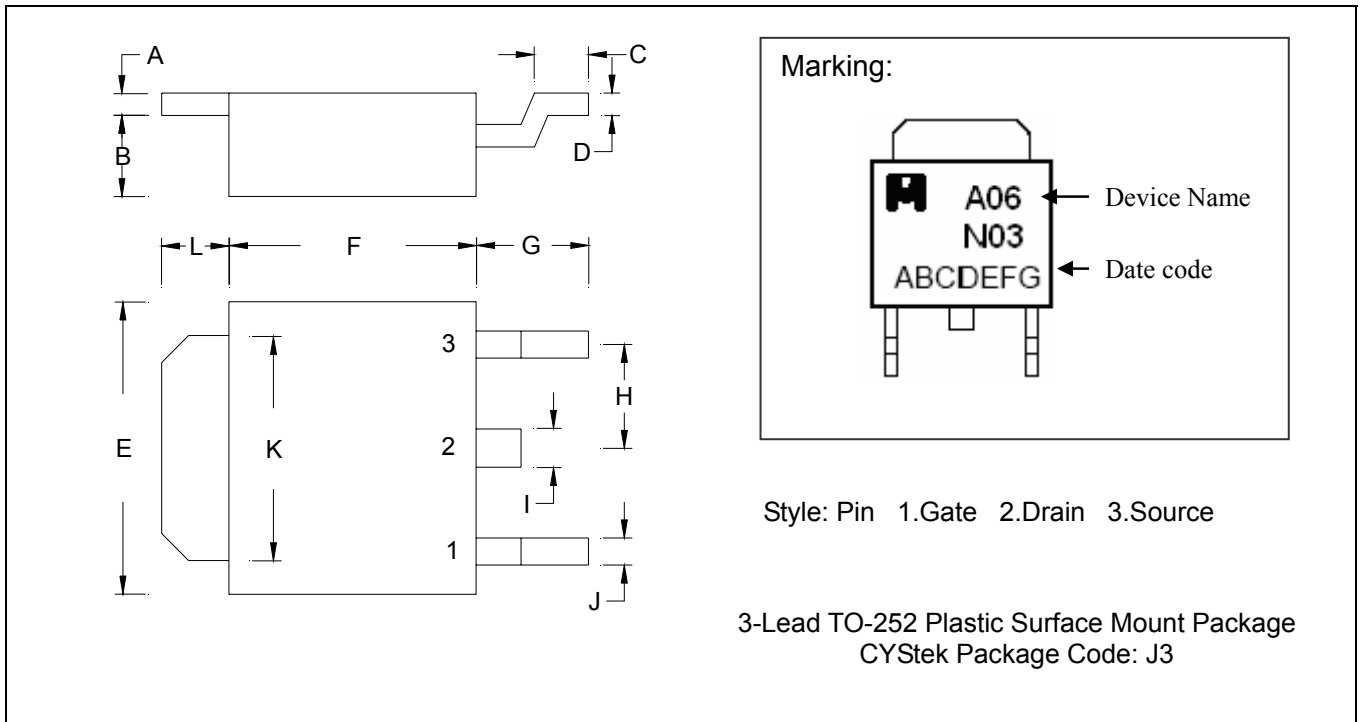
Recommended temperature profile for IR reflow



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(T _{s min}) | 100°C | 150°C |
| -Temperature Max(T _{s max}) | 150°C | 200°C |
| -Time(t _{s min} to t _{s max}) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| -Temperature (T _L) | 183°C | 217°C |
| - Time (t _L) | 60-150 seconds | 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.

TO-252 Dimension



Marking:

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

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

*: Typical

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|--------|-------------|------|-----|--------|---------|-------------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.0177 | 0.0217 | 0.45 | 0.55 | G | 0.0866 | 0.1102 | 2.20 | 2.80 |
| B | 0.0650 | 0.0768 | 1.65 | 1.95 | H | - | *0.0906 | - | *2.30 |
| C | 0.0354 | 0.0591 | 0.90 | 1.50 | I | - | 0.0449 | - | 1.14 |
| D | 0.0177 | 0.0236 | 0.45 | 0.60 | J | - | 0.0346 | - | 0.88 |
| E | 0.2441 | 0.2677 | 6.20 | 6.80 | K | 0.2047 | 0.2165 | 5.20 | 5.50 |
| F | 0.2125 | 0.2283 | 5.40 | 5.80 | L | 0.0551 | 0.0630 | 1.40 | 1.60 |

- 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 : KFC; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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