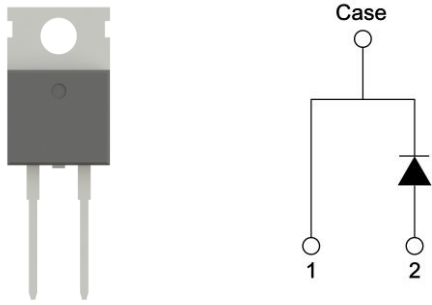


Product Summary

| | | |
|--------------------------|-----|----|
| V_{RRM} | 650 | V |
| $I_F @ T_C=145^{\circ}C$ | 6 | A |
| $Q_C @ V_R=400V$ | 18 | nC |

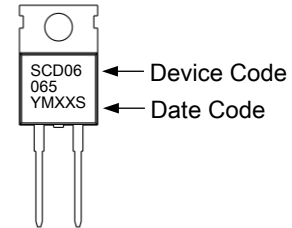
TO-220AC



Features

- Negligible reverse recovery
- High surge current
- Positive temperature coefficient
- Pb-free lead plating and halogen-free

Marking



YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| A: Jan | B: Feb | C: Mar | D: Apr | E: May | F: Jun |
| G: Jul | H: Aug | J: Sep | K: Oct | L: Nov | M: Dec |

XX: Production Serial Number, 01~99

S: Assembly site code, Site 1: A

Ordering Information

| Device | Package | Shipping |
|-------------------|----------|--|
| SCD06065E2-0-UB-G | TO-220AC | 50 pcs/tube, 20 tubes/box, 5 boxes / carton |

0: Product rank, zero for no rank products.

UB: Packing spec, UB : 50 pcs / tube, 20 tubes/box

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

Absolute Maximum Ratings ($T_A=25^{\circ}C$)

| Parameter | Symbol | Value | Unit | |
|--|--------------------|-----------------------|------------------|---|
| Repetitive Peak Reverse Voltage | V_{RRM} | 650 | V | |
| Continuous Forward Current @ $T_C=25^{\circ}C$ | I_F | 14.7 | A | |
| Continuous Forward Current @ $T_C=114^{\circ}C$ | | 9 | | |
| Continuous Forward Current @ $T_C=145^{\circ}C$ | | 6 | | |
| Non-repetitive Forward Surge Current @ $T_C=25^{\circ}C$ | *a I_{FSM} | 48 | | |
| I^2t limit Value @ $T_C=25^{\circ}C$, $t_p=10ms$ | I^2t | 11 | A ² s | |
| Total Power Dissipation | P_D | $T_C=25^{\circ}C$ | 79 | W |
| | | $T_C=110^{\circ}C$ | 34 | |
| | | $T_A=25^{\circ}C$ *b | 6.5 | |
| | | $T_A=110^{\circ}C$ *b | 2.8 | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55~+175 | $^{\circ}C$ | |
| Steady State Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.9 | $^{\circ}C/W$ | |
| Steady State Thermal Resistance, Junction-to-Ambient | *b $R_{\theta JA}$ | 23 | | |

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|----------------|------|------|------|---------------|---|
| Static | | | | | |
| V_R | 650 | - | - | V | $I_R=50\mu\text{A}$ |
| V_F | - | 1.34 | 1.6 | V | $I_F=6\text{A}$, $T_J=25^{\circ}\text{C}$ |
| | - | 1.78 | - | | $I_F=6\text{A}$, $T_J=175^{\circ}\text{C}$ |
| I_R | - | 0.68 | 50 | μA | $V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$ |
| | - | 4.2 | - | | $V_R=650\text{V}$, $T_J=175^{\circ}\text{C}$ |
| Dynamic | | | | | |
| C_J | - | 328 | - | pF | $V_R=0\text{V}$, $f=1\text{MHz}$ |
| | - | 38 | - | | $V_R=200\text{V}$, $f=1\text{MHz}$ |
| | - | 37 | - | | $V_R=400\text{V}$, $f=1\text{MHz}$ |
| Q_C | - | 18 | - | nC | $V_R=400\text{V}$, $f=1\text{MHz}$ |
| E_C | - | 3.1 | - | μJ | $V_R=400\text{V}$, $f=1\text{MHz}$ |

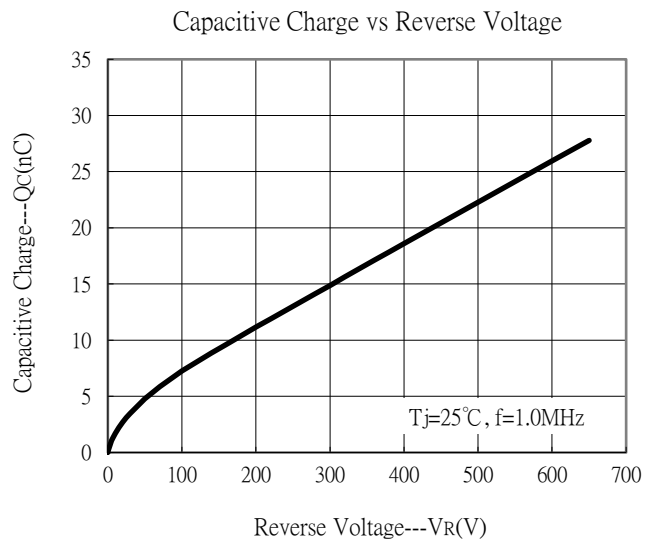
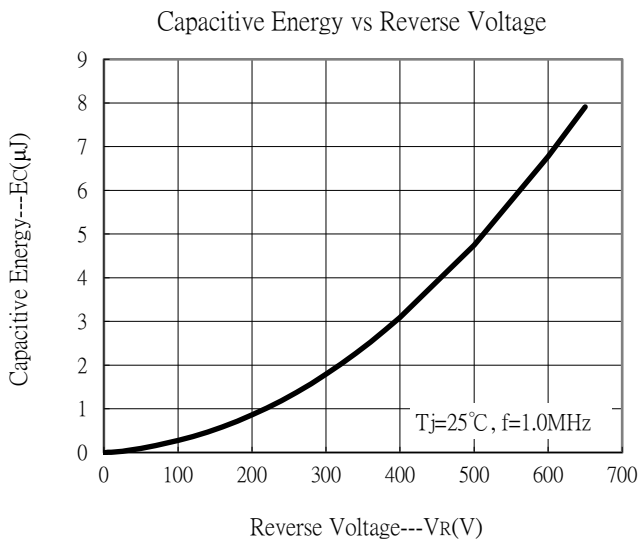
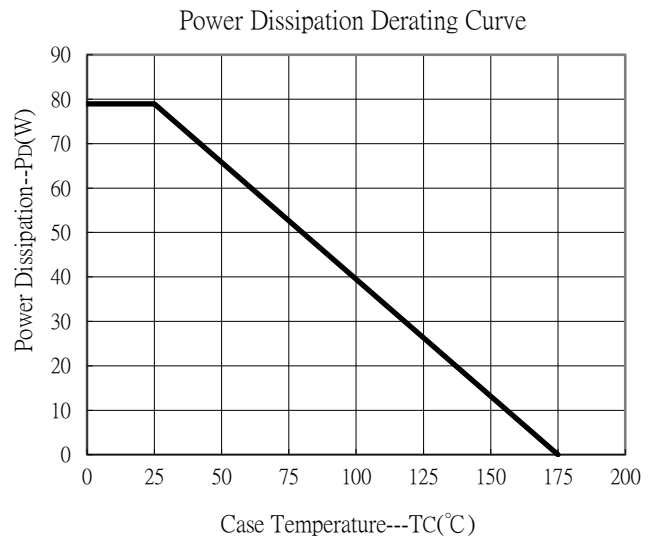
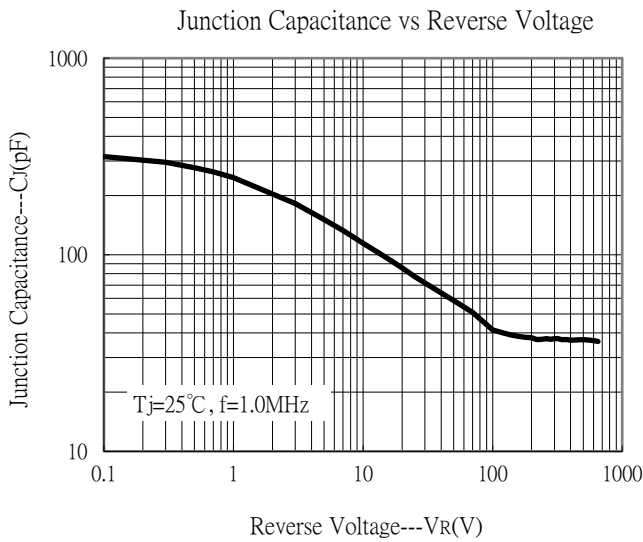
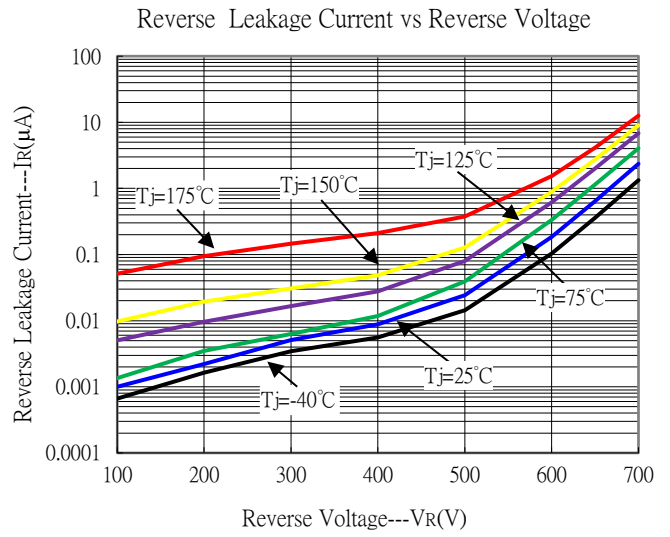
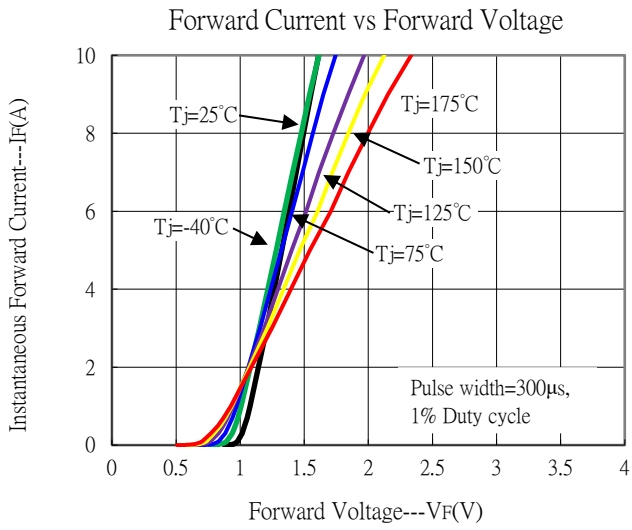
Note:

*a. Square wave, $t_p=10\text{ms}$.

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

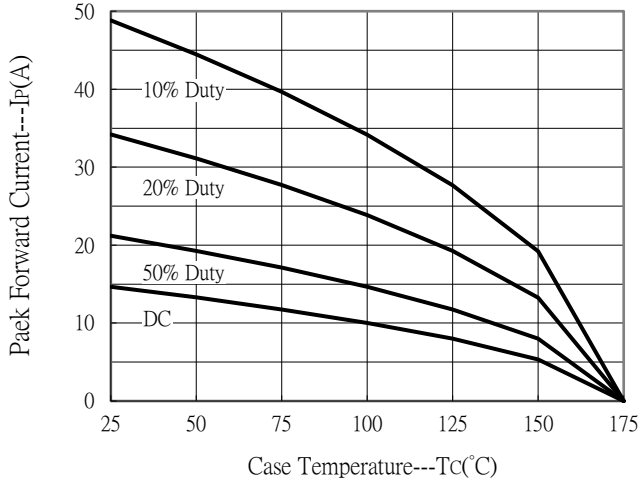
*c. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Typical Characteristics

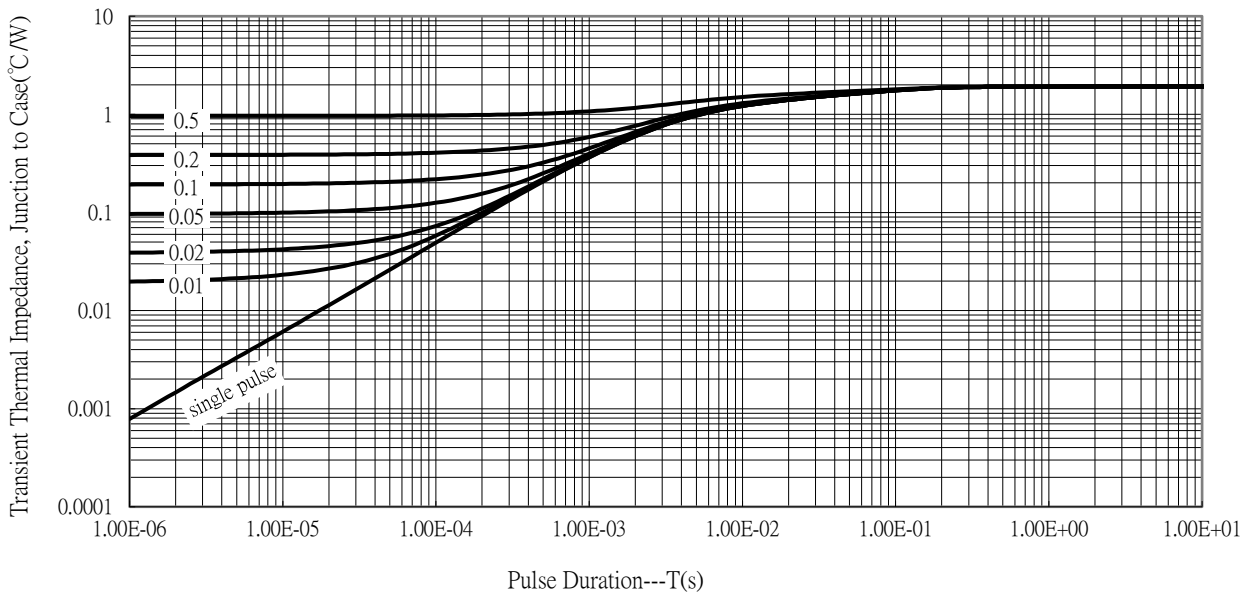


Typical Characteristics (Cont.)

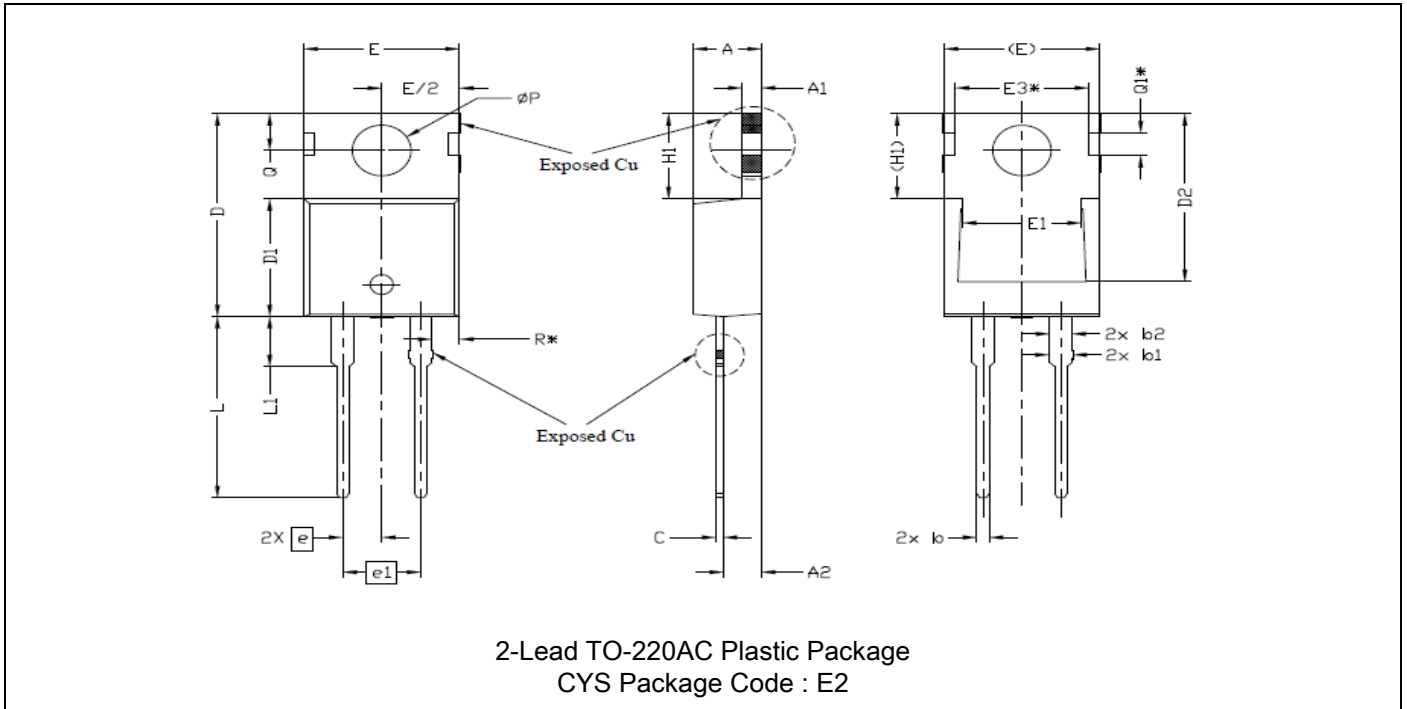
Peak Forward Current vs Case Temperature



Typical Transient Thermal Impedance



TO-220AC Dimension



| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|-------|--------|-------|-----|-------------|-------|-----------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 4.24 | 4.64 | 0.167 | 0.183 | E1 | 6.86 | 8.89 | 0.270 | 0.350 |
| A1 | 1.15 | 1.40 | 0.045 | 0.055 | E3* | 8.70 REF | | 0.343 REF | |
| A2 | 2.30 | 2.70 | 0.091 | 0.106 | e | 2.54 BSC | | 0.100 REF | |
| b | 0.70 | 0.90 | 0.028 | 0.035 | e1 | 5.08 BSC | | 0.200 REF | |
| b1 | 1.20 | 1.75 | 0.047 | 0.069 | H1 | 6.30 | 6.60 | 0.248 | 0.260 |
| b2 | 1.20 | 1.70 | 0.047 | 0.067 | L | 13.47 | 13.97 | 0.530 | 0.550 |
| c | 0.40 | 0.60 | 0.016 | 0.024 | L1 | 3.60 | 4.00 | 0.142 | 0.157 |
| D | 14.70 | 16.00 | 0.579 | 0.630 | ΦP | 3.75 | 3.93 | 0.148 | 0.155 |
| D1 | 8.82 | 9.02 | 0.347 | 0.355 | Q | 2.60 | 3.00 | 0.102 | 0.118 |
| D2 | 12.63 | 12.83 | 0.497 | 0.505 | Q1* | 1.73 REF | | 0.068 REF | |
| E | 9.96 | 10.36 | 0.392 | 0.408 | R* | 1.82 REF | | 0.072 REF | |

Note:

- “*” is reference.
- Controlling dimension: millimeters.
- Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
- 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.

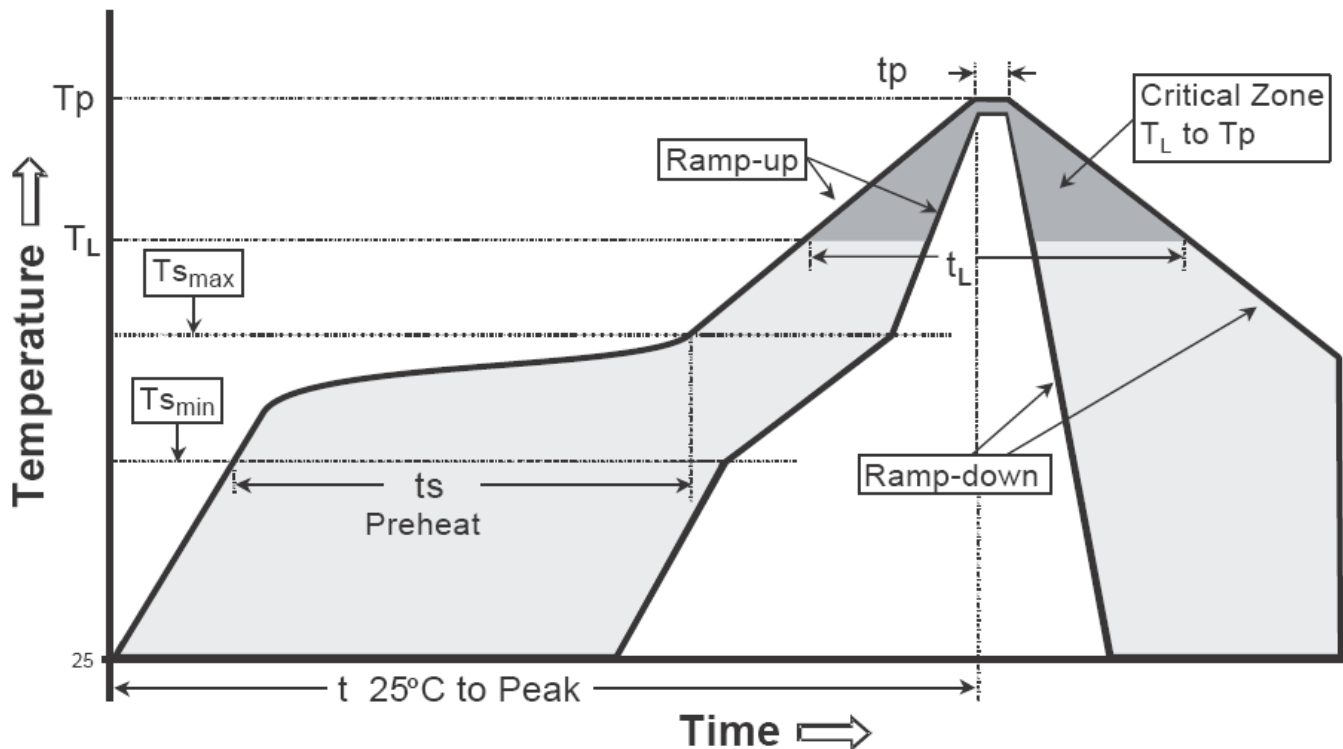
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Recommended wave soldering condition

| | | |
|-----------------|------------------|-----------------|
| 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.