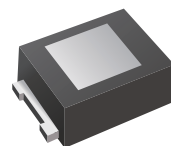




## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Top-side Cooling(TSC) Packaging technology
- Compact and Slim Packaging Solutions
- For surface mounted applications in order to optimize board space
- 600W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Low inductance
- Excellent clamping capability
- Fast response time
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Lead free in comply with EU RoHS 2011/65/EU directives



### Mechanical Data

- Case: SMHM
- Terminals: Solderable per MIL-STD-750, Method 2026
- Polarity: For uni-directional types the band denotes cathode end, no marking on bi-directional types

### Applications

- I/O interface
- Vcc bus
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Ordering Information

| Part Number | Marking       | Shipping           | Reel      |
|-------------|---------------|--------------------|-----------|
| LTVxxA(C)JP | See the Table | 15000PCS Tape&Reel | 13 inches |

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Rating                                                                                                            | Symbol          | Value       | Units                |
|-------------------------------------------------------------------------------------------------------------------|-----------------|-------------|----------------------|
| Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Note2, Fig.1)                                    | $P_{PPM}$       | Minimum 600 | W                    |
| Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)                                                 | $I_{PPM}$       | See Table   | A                    |
| Steady state power dissipation at $T_A=50^{\circ}\text{C}$ (Fig.5)                                                | $P_{M(AV)}$     | 5.0         | W                    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6) | $I_{FSM}$       | 100         | A                    |
| Operating junction and Storage Temperature Range.                                                                 | $T_J, T_{STG}$  | -55 to +150 | $^{\circ}\text{C}$   |
| Typical thermal resistance junction to case                                                                       | $R_{\theta JC}$ | 6           | $^{\circ}\text{C/W}$ |
| Typical thermal resistance junction to ambient                                                                    | $R_{\theta JA}$ | 53          | $^{\circ}\text{C/W}$ |

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^{\circ}\text{C}$  per Fig.2.

2. Mounted on 2mm $\times$ 2mm copper pads to each terminal.

3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum, unidirectional only.



## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ )

| Part Number (Uni) | Part Number (Bi) | Marking | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu\text{A}$ ) |
|-------------------|------------------|---------|-----------------------------------------|--------------------------------------------|--------|-------------------------|-----------------------------------------------|-----------------------------------------|---------------------------------------------------------|
|                   |                  |         |                                         | Min                                        | Max    |                         |                                               |                                         |                                                         |
| LTV6.8AJP         | LTV6.8CJP        | 6J8P    | 5.80                                    | 6.45                                       | 7.14   | 10                      | 10.5                                          | 58.1                                    | 500                                                     |
| LTV7.5AJP         | LTV7.5CJP        | 7J5P    | 6.40                                    | 7.13                                       | 7.88   | 10                      | 11.3                                          | 54.0                                    | 400                                                     |
| LTV8.2AJP         | LTV8.2CJP        | 8J2P    | 7.02                                    | 7.79                                       | 8.61   | 10                      | 12.1                                          | 50.4                                    | 200                                                     |
| LTV9.1AJP         | LTV9.1CJP        | 9J1P    | 7.78                                    | 8.65                                       | 9.55   | 1                       | 13.4                                          | 45.5                                    | 50                                                      |
| LTV10AJP          | LTV10CJP         | 10JP    | 8.55                                    | 9.50                                       | 10.50  | 1                       | 14.5                                          | 42.1                                    | 10                                                      |
| LTV11AJP          | LTV11CJP         | 11JP    | 9.40                                    | 10.50                                      | 11.60  | 1                       | 15.6                                          | 39.1                                    | 1                                                       |
| LTV12AJP          | LTV12CJP         | 12JP    | 10.20                                   | 11.40                                      | 12.60  | 1                       | 16.7                                          | 36.5                                    | 1                                                       |
| LTV13AJP          | LTV13CJP         | 13JP    | 11.10                                   | 12.40                                      | 13.70  | 1                       | 18.2                                          | 33.5                                    | 1                                                       |
| LTV15AJP          | LTV15CJP         | 15JP    | 12.80                                   | 14.30                                      | 15.80  | 1                       | 21.2                                          | 28.8                                    | 1                                                       |
| LTV16AJP          | LTV16CJP         | 16JP    | 13.60                                   | 15.20                                      | 16.80  | 1                       | 22.5                                          | 27.1                                    | 1                                                       |
| LTV18AJP          | LTV18CJP         | 18JP    | 15.30                                   | 17.10                                      | 18.90  | 1                       | 25.5                                          | 24.2                                    | 1                                                       |
| LTV20AJP          | LTV20CJP         | 20JP    | 17.10                                   | 19.00                                      | 21.00  | 1                       | 27.7                                          | 22.0                                    | 1                                                       |
| LTV22AJP          | LTV22CJP         | 22JP    | 18.80                                   | 20.90                                      | 23.10  | 1                       | 30.6                                          | 19.9                                    | 1                                                       |
| LTV24AJP          | LTV24CJP         | 24JP    | 20.50                                   | 22.80                                      | 25.20  | 1                       | 33.2                                          | 18.4                                    | 1                                                       |
| LTV27AJP          | LTV27CJP         | 27JP    | 23.10                                   | 25.70                                      | 28.40  | 1                       | 37.5                                          | 16.3                                    | 1                                                       |
| LTV30AJP          | LTV30CJP         | 30JP    | 25.60                                   | 28.50                                      | 31.50  | 1                       | 41.4                                          | 14.7                                    | 1                                                       |
| LTV33AJP          | LTV33CJP         | 33JP    | 28.20                                   | 31.40                                      | 34.70  | 1                       | 45.7                                          | 13.3                                    | 1                                                       |
| LTV36AJP          | LTV36CJP         | 36JP    | 30.80                                   | 34.20                                      | 37.80  | 1                       | 49.9                                          | 12.2                                    | 1                                                       |
| LTV39AJP          | LTV39CJP         | 39JP    | 33.30                                   | 37.10                                      | 41.00  | 1                       | 53.9                                          | 11.3                                    | 1                                                       |
| LTV43AJP          | LTV43CJP         | 43JP    | 36.80                                   | 40.90                                      | 45.20  | 1                       | 59.3                                          | 10.3                                    | 1                                                       |
| LTV47AJP          | LTV47CJP         | 47JP    | 40.20                                   | 44.70                                      | 49.40  | 1                       | 64.8                                          | 9.4                                     | 1                                                       |
| LTV51AJP          | LTV51CJP         | 51JP    | 43.60                                   | 48.50                                      | 53.60  | 1                       | 70.1                                          | 8.7                                     | 1                                                       |
| LTV56AJP          | LTV56CJP         | 56JP    | 47.80                                   | 53.20                                      | 58.80  | 1                       | 77                                            | 7.9                                     | 1                                                       |
| LTV62AJP          | LTV62CJP         | 62JP    | 53.00                                   | 58.90                                      | 65.10  | 1                       | 85                                            | 7.2                                     | 1                                                       |
| LTV68AJP          | LTV68CJP         | 68JP    | 58.10                                   | 64.60                                      | 71.40  | 1                       | 92                                            | 6.6                                     | 1                                                       |
| LTV75AJP          | LTV75CJP         | 75JP    | 64.10                                   | 71.30                                      | 78.80  | 1                       | 103                                           | 5.9                                     | 1                                                       |
| LTV82AJP          | LTV82CJP         | 82JP    | 70.10                                   | 77.90                                      | 86.10  | 1                       | 113                                           | 5.4                                     | 1                                                       |
| LTV91AJP          | LTV91CJP         | 91JP    | 77.80                                   | 86.50                                      | 95.50  | 1                       | 125                                           | 4.9                                     | 1                                                       |
| LTV100AJP         | LTV100CJP        | 100JP   | 85.50                                   | 95.00                                      | 105.00 | 1                       | 137                                           | 4.5                                     | 1                                                       |
| LTV110AJP         | LTV110CJP        | 110JP   | 94.00                                   | 105.00                                     | 116.00 | 1                       | 152                                           | 4.0                                     | 1                                                       |
| LTV120AJP         | LTV120CJP        | 120JP   | 102.00                                  | 114.00                                     | 126.00 | 1                       | 165                                           | 3.7                                     | 1                                                       |
| LTV130AJP         | LTV130CJP        | 130JP   | 111.00                                  | 124.00                                     | 137.00 | 1                       | 179                                           | 3.4                                     | 1                                                       |
| LTV150AJP         | LTV150CJP        | 150JP   | 128.00                                  | 143.00                                     | 158.00 | 1                       | 207                                           | 2.9                                     | 1                                                       |
| LTV160AJP         | LTV160CJP        | 160JP   | 136.00                                  | 152.00                                     | 168.00 | 1                       | 219                                           | 2.8                                     | 1                                                       |
| LTV170AJP         | LTV170CJP        | 170JP   | 145.00                                  | 162.00                                     | 179.00 | 1                       | 234                                           | 2.6                                     | 1                                                       |
| LTV180AJP         | LTV180CJP        | 180JP   | 154.00                                  | 171.00                                     | 189.00 | 1                       | 246                                           | 2.5                                     | 1                                                       |
| LTV200AJP         | LTV200CJP        | 200JP   | 171.00                                  | 190.00                                     | 210.00 | 1                       | 274                                           | 2.2                                     | 1                                                       |
| LTV220AJP         | LTV220CJP        | 220JP   | 185.00                                  | 209.00                                     | 231.00 | 1                       | 328                                           | 1.9                                     | 1                                                       |
| LTV250AJP         | LTV250CJP        | 250JP   | 214.00                                  | 237.00                                     | 263.00 | 1                       | 344                                           | 1.8                                     | 1                                                       |
| LTV300AJP         | LTV300CJP        | 300JP   | 256.00                                  | 285.00                                     | 315.00 | 1                       | 414                                           | 1.5                                     | 1                                                       |
| LTV350AJP         | LTV350CJP        | 350JP   | 300.00                                  | 332.00                                     | 368.00 | 1                       | 482                                           | 1.3                                     | 1                                                       |
| LTV400AJP         | LTV400CJP        | 400JP   | 342.00                                  | 380.00                                     | 420.00 | 1                       | 548                                           | 1.1                                     | 1                                                       |
| LTV440AJP         | LTV440CJP        | 440JP   | 376.00                                  | 418.00                                     | 462.00 | 1                       | 602                                           | 1.0                                     | 1                                                       |
| LTV480AJP         | LTV480CJP        | 480JP   | 408.00                                  | 456.00                                     | 504.00 | 1                       | 658                                           | 0.9                                     | 1                                                       |
| LTV510AJP         | LTV510CJP        | 510JP   | 434.00                                  | 485.00                                     | 535.00 | 1                       | 698                                           | 0.9                                     | 1                                                       |
| LTV530AJP         | LTV530CJP        | 530JP   | 450.00                                  | 503.50                                     | 556.50 | 1                       | 725                                           | 0.8                                     | 1                                                       |
| LTV540AJP         | LTV540CJP        | 540JP   | 459.00                                  | 513.00                                     | 567.00 | 1                       | 740                                           | 0.8                                     | 1                                                       |
| LTV550AJP         | LTV550CJP        | 550JP   | 467.00                                  | 522.50                                     | 577.50 | 1                       | 760                                           | 0.8                                     | 1                                                       |

Notes: For bidirectional type having  $V_R$  of 10V and less, the  $I_R$  limit is double.



Characteristics Curves ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Fig.1 Peak Pulse Power Rating Curve

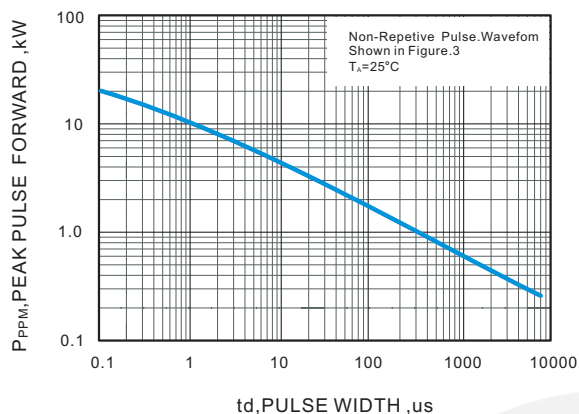


Fig.2 Forward Current Derating Curve

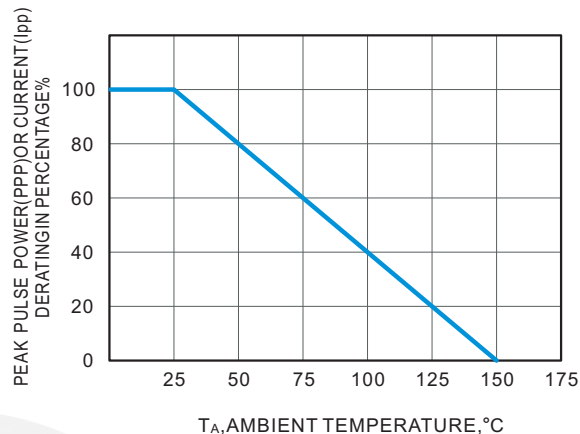


Fig.3 Pulse Waveform

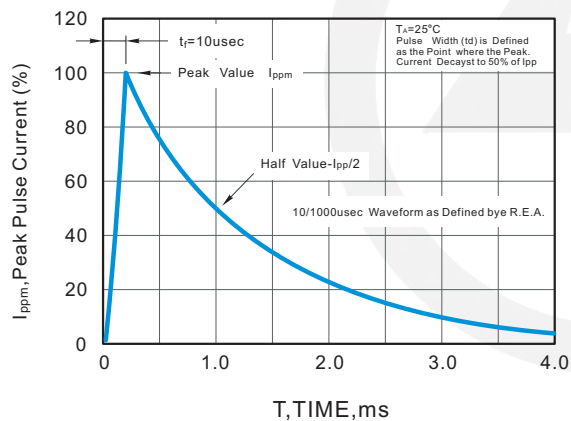
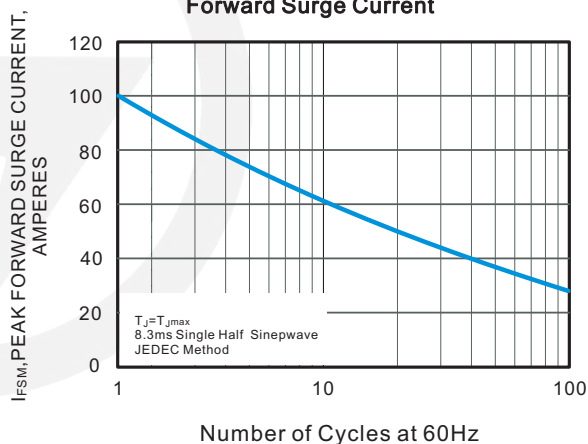
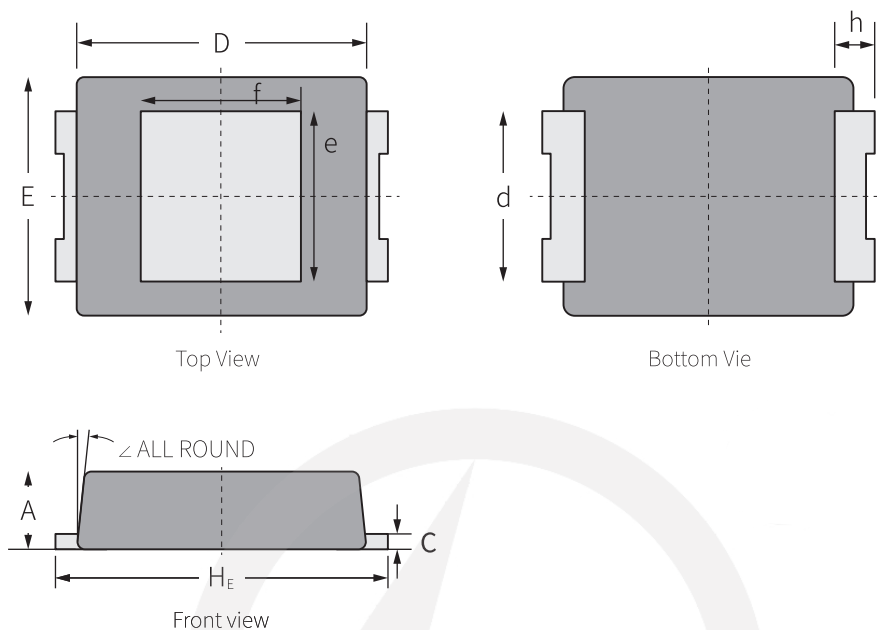
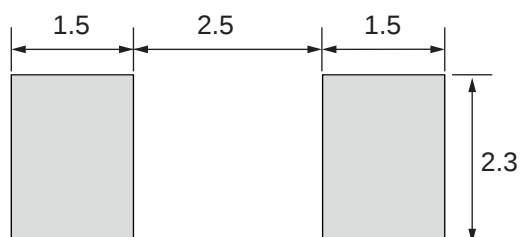


Fig.4 Maximum Non-Repetitive Peak Forward Surge Current



**Package Outline**
**SMHM**
**Unit : mm**


| UNIT |     | A    | C    | D    | E    | H <sub>E</sub> | d    | e    | f    | h    | ∠  |
|------|-----|------|------|------|------|----------------|------|------|------|------|----|
| mm   | max | 0.99 | 0.25 | 3.60 | 3.00 | 4.30           | 2.10 | 2.10 | 2.00 | 0.70 | 6° |
|      | min | 0.83 | 0.15 | 3.20 | 2.60 | 3.70           | 1.90 | 1.90 | 1.78 | 0.50 |    |

**Suggested Pad Layout**
**SMHM**
**Unit : mm**


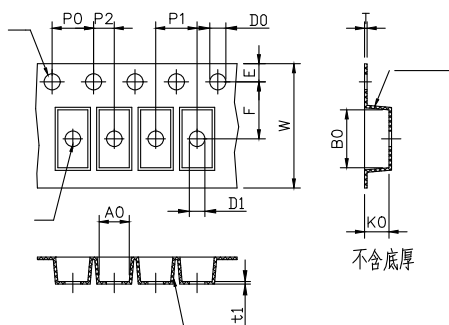
Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purpose only.



Carrier Tape Dimensions

Unit : mm

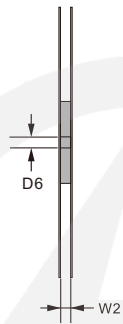
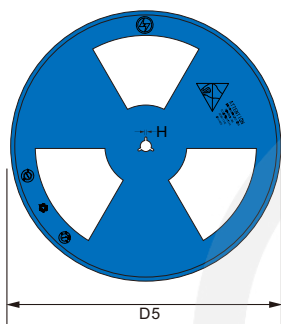


| Symbol | Spec      | Symbol | Spec      |
|--------|-----------|--------|-----------|
| W      | 12.0±0.10 | P2     | 2.00±0.10 |
| E      | 1.75±0.10 | t      | 0.25±0.03 |
| F      | 5.50±0.10 | t1     | 0.05+     |
| D0     | 1.55±0.10 | A0     | 3.05±0.10 |
| D1     | 1.50±0.10 | B0     | 4.30±0.10 |
| P0     | 4.00±0.10 | K0     | 1.15±0.10 |
| P1     | 4.00±0.10 |        |           |

Reel Dimensions

Unit : mm

13" Reel

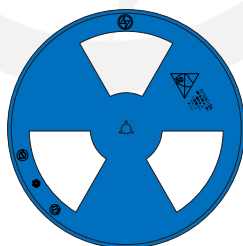


|                    |            |
|--------------------|------------|
| D5                 | Φ330.0±5.0 |
| D6                 | Φ13.5±0.5  |
| H                  | 2.5±1.0    |
| W2                 | 12±2.0     |
| Quantity: 15000PCS |            |

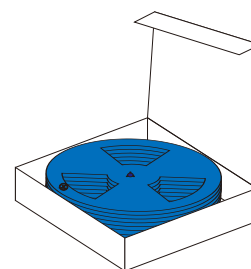
Packaging



15000 PCS/Reel



5 Reel/Inner Box  
75 KPCS/Inner Box



Dim(Unit:mm)  
340mm\*340mm\*85mm

Dim(Unit:mm)  
360mm\*360mm\*355mm

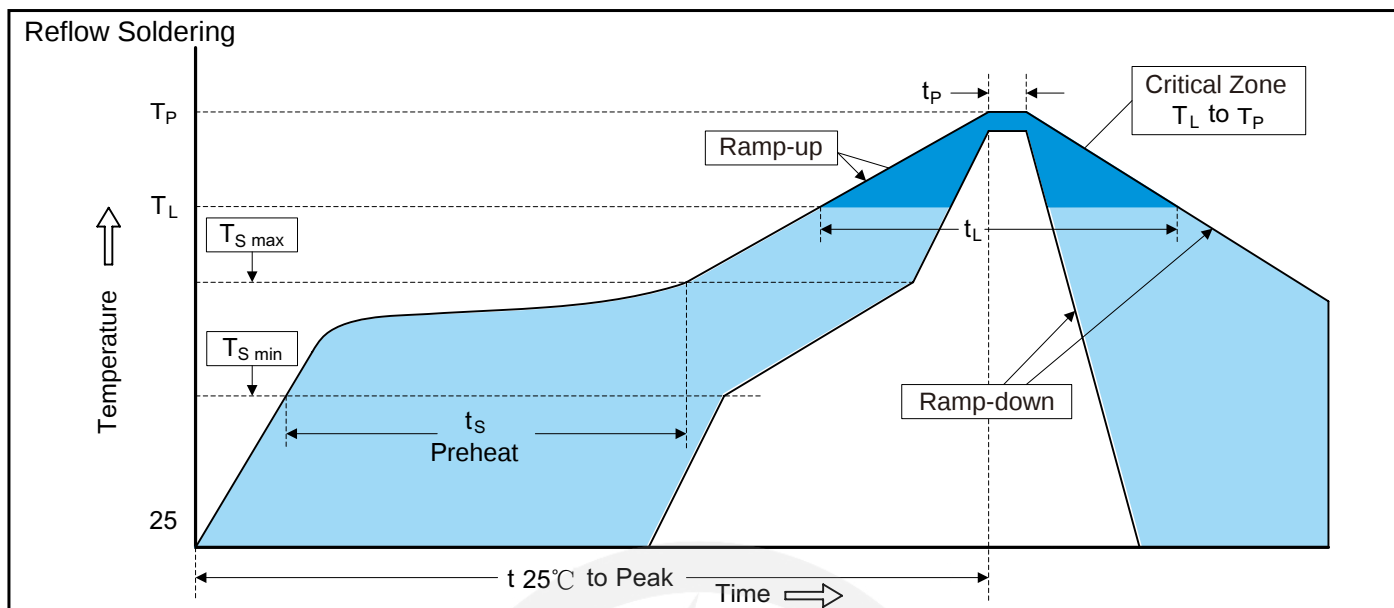


4 Boxes per carton  
300 KPCS per carton

13 inches Reel



## Recommended Soldering Conditons



### Recommended Conditions

| Profile Feature                                      | Pb-Free Assembly |
|------------------------------------------------------|------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )              | 3°C/second max.  |
| Preheat                                              |                  |
| -Temperature Min ( $T_{S \min}$ )                    | 150°C            |
| -Temperature Max ( $T_{S \max}$ )                    | 200°C            |
| -Time (min to max) ( $t_s$ )                         | 60-180 seconds   |
| $T_{S \max}$ to $T_L$                                |                  |
| -Ramp-up Rate                                        | 3°C/second max.  |
| Time maintained above:                               |                  |
| -Temperature ( $T_L$ )                               | 217°C            |
| -Time ( $t_L$ )                                      | 60-150 seconds   |
| Peak Temperature ( $T_P$ )                           | 260°C            |
| Time within 5°C of actual Peak Temperature ( $t_p$ ) | 20-40 seconds    |
| Ramp-down Rate                                       | 6°C/second max.  |
| Time 25°C to Peak Temperature                        | 8 minutes max.   |

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## Version Update Information

| Series NO. | Enactment/Revision Date | Effective Date | Version | Revision Content | Revision Reason | Revision Person | Note |
|------------|-------------------------|----------------|---------|------------------|-----------------|-----------------|------|
| 01         | 2025.08.04              | 2025.08.04     | 1.0     | New file         | /               | Ding            |      |