NING BO RHT ELECTR ONIC CO.,LTD

APPROVAL SHEET

RoHS Compliant

(Seam Type)

CUSTOMER：

DESCRIPTION： SMD3225 12.000MHz Quartz Crystal Resonator

MANUFACTURER PART NO.： 12.000M8SM3S-15/15BFC47

CUSTOMER PART NO：

USED IN MODEL：

REVISION A1

APPROVAL		
TECHNOLOGY DEPT.	QUALITY DEPT.	PURCHASING DEPT.

Rev	Revise page	Revise contents	Date	Ref.No.	Reviser
A1	ALL	Initial released	2022.11.11	N/A	DavidJiang

1. QUARTZ CRYSTAL UNIT SPECIFICATION

Parameter	Sign	Specification
1.1 Nominal Frequency :	F0	12.000MHz
1.2 Holder type :	-	（SMD3225 SEAM TYPE）
1.3 Mode of oscillation :	-	Fundamental
1.4 Frequency tolerance :	FL	±15ppm at 25℃±3℃
1.5 Equivalent resistance :	RR	80ohms max.
1.6 Operating temperature range :	T_{OPR}	-20℃ To +70℃
1.7 Storage temperature range :	T_{STG}	-55℃ To +125℃
1.8 Frequency Stability :	TC	±15ppm at -20℃ To +70℃
1.9 Loading capacitance :	CL	8pF
1.10 Drive level :	DL	10 uW Typical. 200uW Max
1.11 Shunt Capacitance :	C0	2.0pF max.
1.12 Insulation resistance :	IR	More than 500MΩ at DC 100V
1.13 Circuit:	-	Measured in HP/E5100A,S&A 250B
1.14 Aging :	Fa	±3ppm max. (+25℃ 1st Year)
1.15 Dimensions and marking :		Refer to page.3
1.16 Emboss carrier tape & reel :		Refer to page.5 and page.6

1.17 Note :

Standard atmospheric conditions

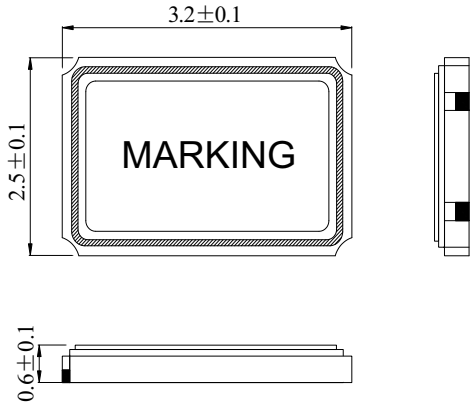
Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

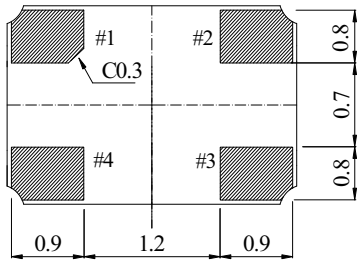
Ambient temperature : 25±3℃

Relative humidity : 40%~70%

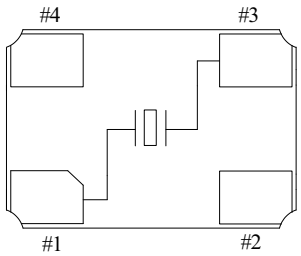
2. MARKING & DIMENSIONS

(UNIT: mm)

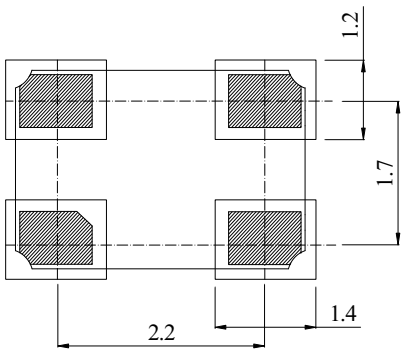




Marking #2, #4 is connected with metal cap of top.



<TOP VIEW>



Recommended Solder Pad Layout:

*Marking should be printed as following:

Logo, Nominal Frequency

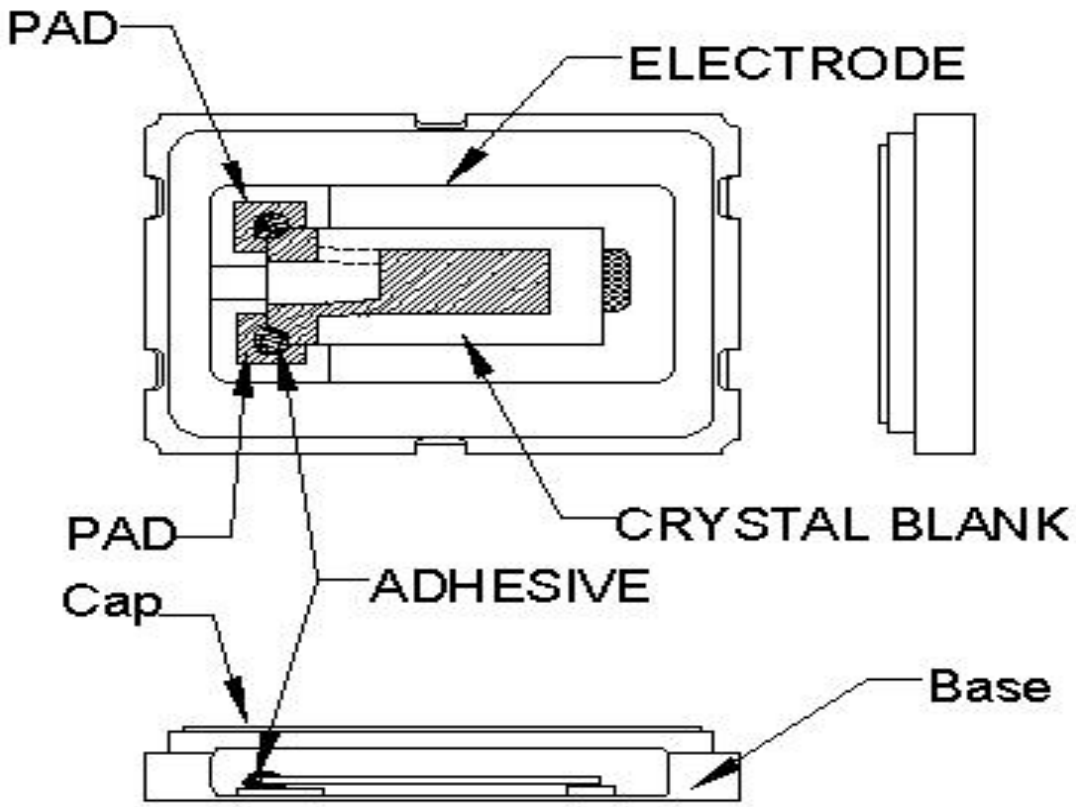
*Manufacturing Logo: RHT

*Nominal frequency = 3 number after decimal point MAX.

(ex. 12.000 MHz → 12.000)

Marking: Laser marking

3. INSIDE STRUCTURE

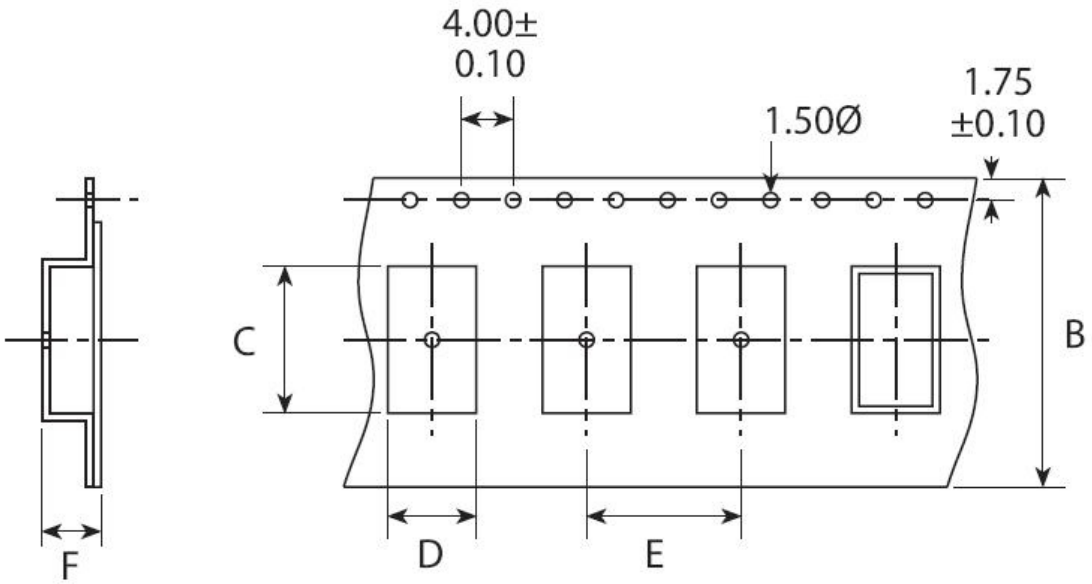


Reference drawing

Base: Alumina Ceramic (Al_2O_3) Metallized Pad: W Ni Plating Au Plating
Cap: Fe-Ni
(3) Crystal Enclosure Seal: Seal Seam
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Polyimide Resin
(6) Electrode Ag
(7) PAD Alumina Ceramic (W. Ni. Au)

4. EMBOSS CARRIER TAPE & REEL

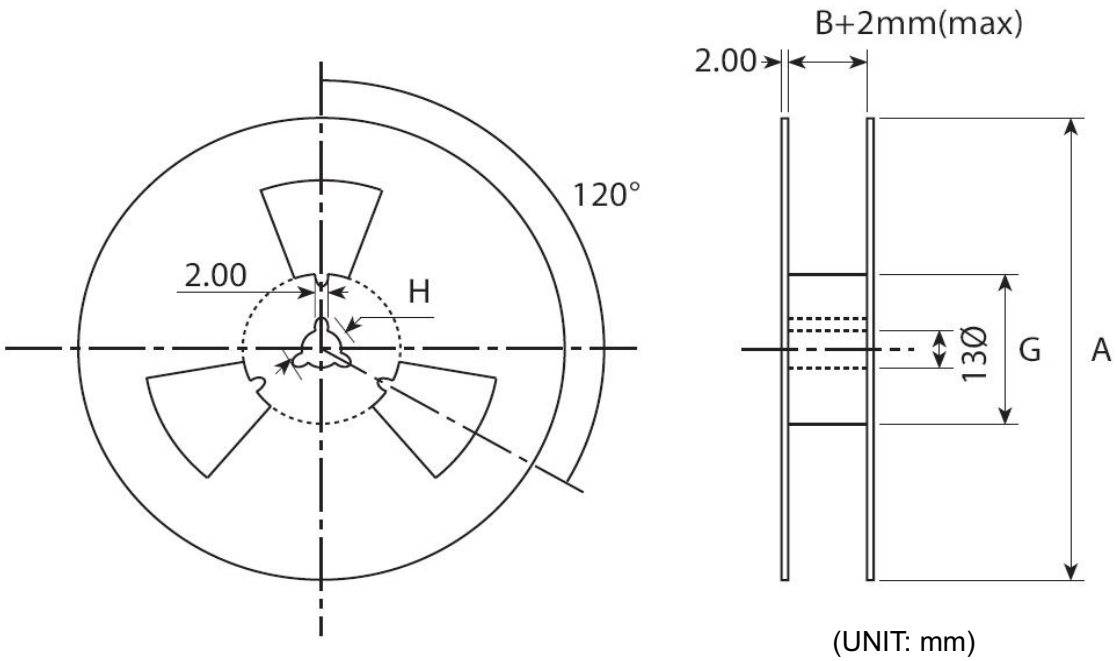
a.) Dimensions of Carrier Tape



	A	B	C	D	E	F	G
SMD3225	178±2.0	8.0±0.3	3.5±0.1	2.8±0.1	4.0±0.1	1.4±0.1	60.5±1.0

(UNIT: mm)

b.) Dimensions of Reel



(UNIT: mm)

c.) Storage condition

Temperature: +40deg.C Max.

Relative Humidity: 80% Max.

d.) Standard packing quantity

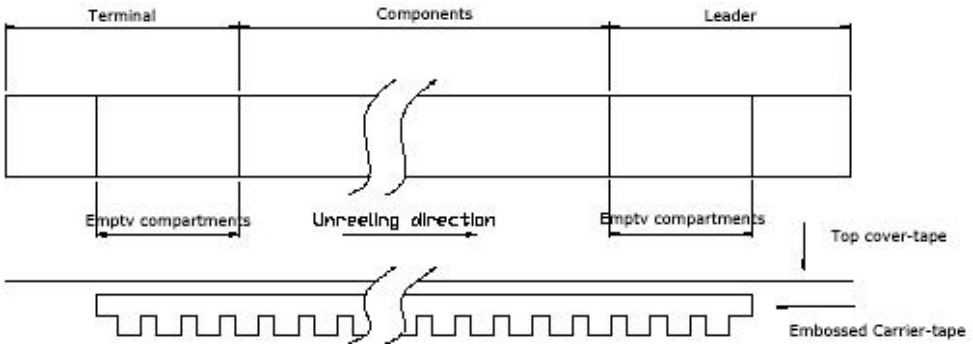
3,000PCS / REEL

e.) Material of the tape

Tape	Material
Carrier tape	A – PET
Top tape	Polyester

g.) Taping dimension

Leader	Cover-tape	The length of cover-tape in the leader is more than 400 mm including empty embossed area.
	Carrier-tape	After all products were packaged, must remain more than twenty pieces or 400 mm empty area, which should be sealed by cover-tape.
Terminal	Cover-tape	The tip of cover-tape shall be fixed temporary by paper tape and roll around the core of reel one round.
	Carrier-tape	The empty embossed area which are sealed by top cover-tape must remain more the 40 mm.

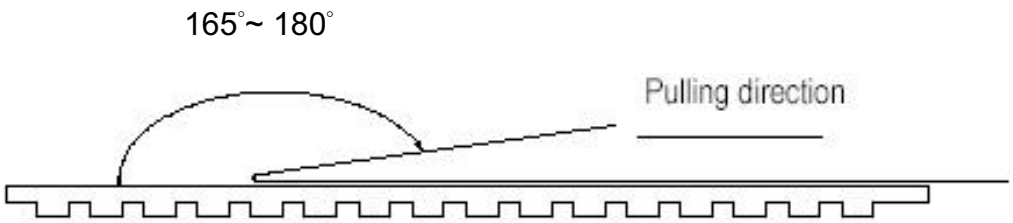


h.) Joint of tape

The carrier-tape and top cover-tape should not be jointed.

i.) Release strength of cover tape

It has to between 0.1N to 0.7N under following condition.
Pulling direction 165° to 180°
Speed 300mm/min.
Otherwise unless specified.



Other standards shall be based on JIS C 0806-1990.

5. Mechanical Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour.

	Item	Conditions	Specifications
5.1	Drop	Fall freely from 100 cm of height 3 times on a firm wood	MIL-STD-202F-203B
5.2	Mechanical Shock	Device are shocked to half sine wave (1000 G) three mutually perpendicular axes each 3 times.	MIL-STD-202F
5.3	Vibration	(1)Vibration Frequency: 10~55Hz (2)Cycle: 1 to 2 Min. (3)Full Cycle: 1.5mm P-P. (4)Direction: X.Y.Z (5)Time: 2 Hours / Each Direction	MIL-STD-883E
5.4	Substrate Bending	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –1 Speed: 0.5 mm/sec Hours: 5 ± 1 sec Amount of substrate: 3 mm Max.	Without mechanical damage such as breaks. Without electrode peeling. Electrical characteristics shall be satisfied.
5.5	Adhesion	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –2 Weight: 10N Hours: 10 ± 1 sec	
5.6	Body strength	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –3 Weight: 10N Hours: 10 ± 1 sec	
5.7	Seal	Fine Leak: 4.5kgf/cm^2 2hours 1×10^{-9} Pa.m^3/sec Gross Leak: 4.5kgf/cm^2 2hours 1.5×10^{-5} Pa.m^3/sec	MIL-STD-883E

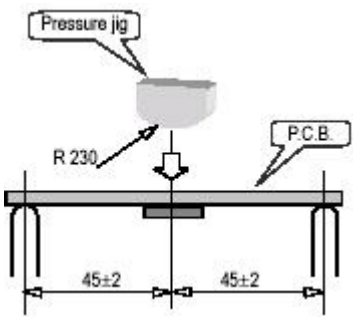


Fig-1

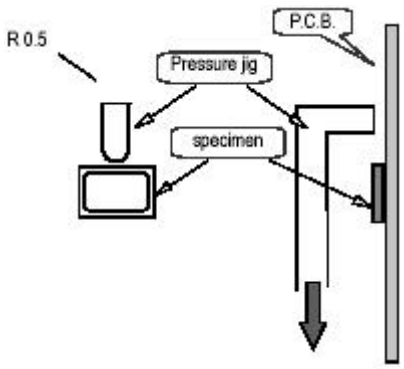


Fig-2

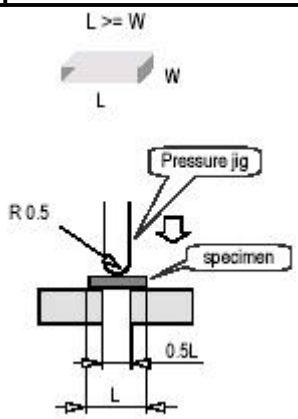
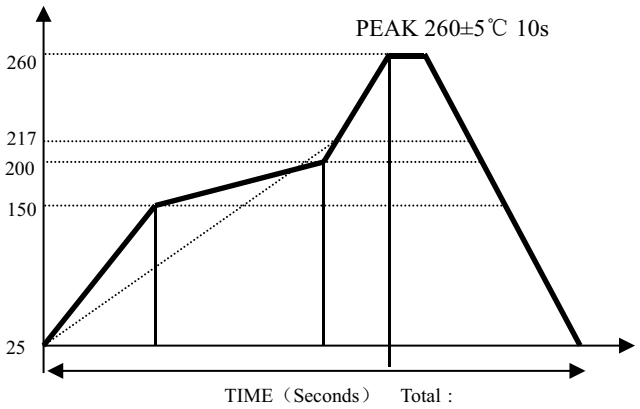


Fig-3

<table>
<tr><td>5.8</td><td>Solder ability</td><td>Pre-heat temperature : +150±10℃
Pre-heat time : 60~120s
When the temperature of the specimen is reached at +215±3℃, it shall be left for 30±1sec.
Peak temperature 240±5℃
Material: Pb-free (Sn-3.0Ag-0.5Cu)
Flux : Rosin resin methyl alcohol solvent (1:4)
The electrodes should be covered by a new solder at least 90% of immersed area.</td><td>MIL-STD-883E 2003</td></tr>
<tr><td>5.9</td><td>Resistance to Soldering Heat</td><td>Run in Reflow
Reflow soldering shall be allowed
Only two(2) time.

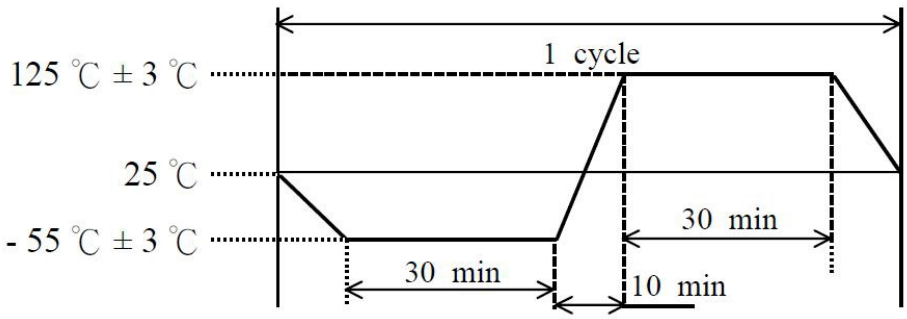
Available for Lead Free Soldering

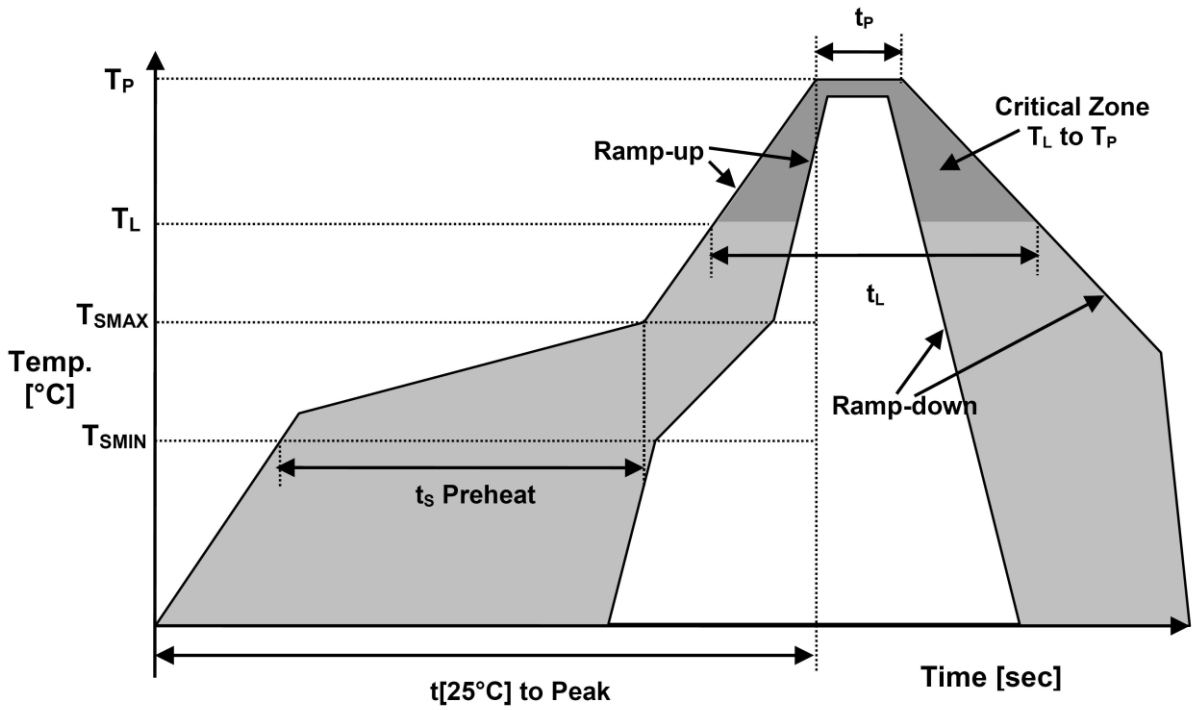
<table>
<tr><td>(1)</td><td>Preheat</td><td>160~180 deg.C</td><td>120sec.</td></tr>
<tr><td>(2)</td><td>Primary heat</td><td>220 deg.C</td><td>60sec.</td></tr>
<tr><td>(3)</td><td>Peak</td><td>260 deg.C</td><td>10sec. Max.</td></tr>
</table></td><td>MIL-STD-202F</td></tr>
</table>

6. Environmental Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour.

	Item	Conditions	Specifications
6.1	Humidity	+60℃±2℃,RH 80~85%, Duration of 500 hours. The units are then allowed to stand for approx 2 hours in room temperature before checking	MIL-STD-202F
6.2	Storage in Low Temperature	Temperature: -40±2℃ , Duration of 500 hours. The units are then allowed to stand at room temperature for approx 2 hours before checking.	MIL-STD-883E
6.3	Storage in High Temperature	Temperature:+ 85℃±2℃, Duration of 500 hours. The units are then allowed to stand at room temperature for approx 2 hours before checking.	MIL-STD-883E
6.4	Thermal Shock	Temperature 1: -55℃±5℃ Temperature 2: 125℃±5℃ Temperature change between T1 and T2 at soonest Run 100 cycles, maintain T1 and T2 30minutes each in one cycle (Refer to Fig-4)	MIL-STD-883E



7. Recommended Solder Reflow Profile



Temperature Min Preheat	T_{SMIN}	150℃
Temperature Max Preheat	T_{SMAX}	175℃
Time (T_{SMIN} to T_{SMAX})	t_S	60-180 sec.
Temperature	T_L	217℃
Peak Temperature	T_P	260℃
Ramp-up rate	R_{UP}	3℃/sec max.
Ramp-down rate	R_{DOWN}	6℃/sec max.
Time within 5°C of Peak Temperature	t_P	10 sec max.
Time t[25°C] to Peak Temperature	t[25°C] to Peak	480 sec max.
Time	t_L	60-150 sec.