



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

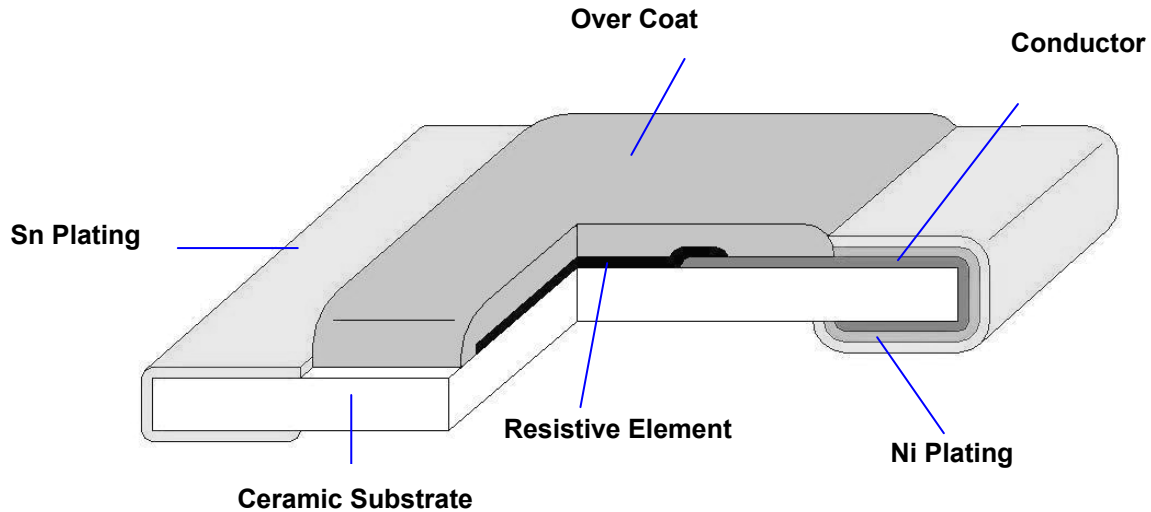
Issued Date 2008/12/23

page number 1/11

1. Scope :

This specification applies for the RMG series chip resistors made by TA-I.

2. Construction:



3. Type Designation:

RMG

10

J

I

103

Product Code

Size

Tolerance

Packaging

Nominal

RMG : Chip Resistor

Power Rating

Resistance

04-0402(1005) - 1/16W
 06-0603(1608) - 1/10 W
 10-0805(2012) - 1/8 W
 12-1206(3216) - 1/4 W

J-±5%
 G-±2%
 F-±1%
 G-±0.5%

T-Paper Tape

3 digits, e.g.,:
 (E-24) 103 = 10KΩ

4 digits, e.g., :
 (E-96) 1540 = 154Ω



General Purpose Chip Resistors

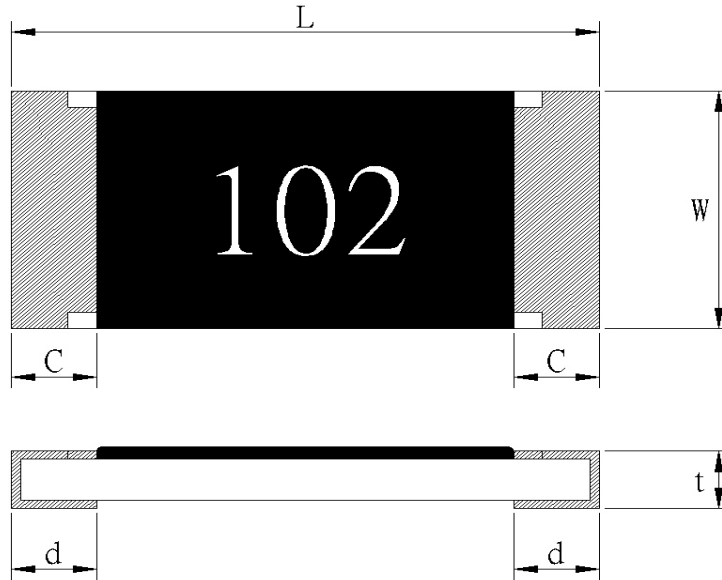
(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 2/11

4. Dimensions :



UNIT: mm

Type	L	W	C	d	t
RMG04	1.00 ^{+0.10} _{-0.05}	0.50±0.05	0.25±0.15	0.30±0.15	0.30±0.05
RMG06	1.50±0.10	0.80±0.10	0.30±0.20	0.40±0.20	0.40±0.10
RMG10	2.00±0.15	1.25±0.15	0.40±0.20	0.60±0.20	0.50±0.10
RMG12	3.10±0.20	1.50±0.20	0.50±0.30	0.70±0.20	0.50±0.10



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 3/11

5. Ratings & Characteristics :

Type	Power Rating at 70°C	Rating Voltage	Max. Working Voltage	Max. Over- Load Voltage	T.C.R (PPM/°C)	Resistance Range(Ω)		
						D(±0.5%),F(±1%) E-96&E-24	G(±2%) E-24	J(±5%) E-24
RMG04	1/16W	Refer 5.2	50V	100V	±100	1 Ω-100KΩ		
RMG06	1/10W	Refer 5.2	50V	100V	±100	1 Ω-390KΩ		
RMG10	1/8W	Refer 5.2	150V	300V	±100	1 Ω-800KΩ		
RMG12	1/4W	Refer 5.2	200V	400V	±100	1 Ω-1MΩ		

5.1 Derating Curve :

For resistors operated at ambient temperature over 70°C , power rating shall be derated in accordance with figure 1.

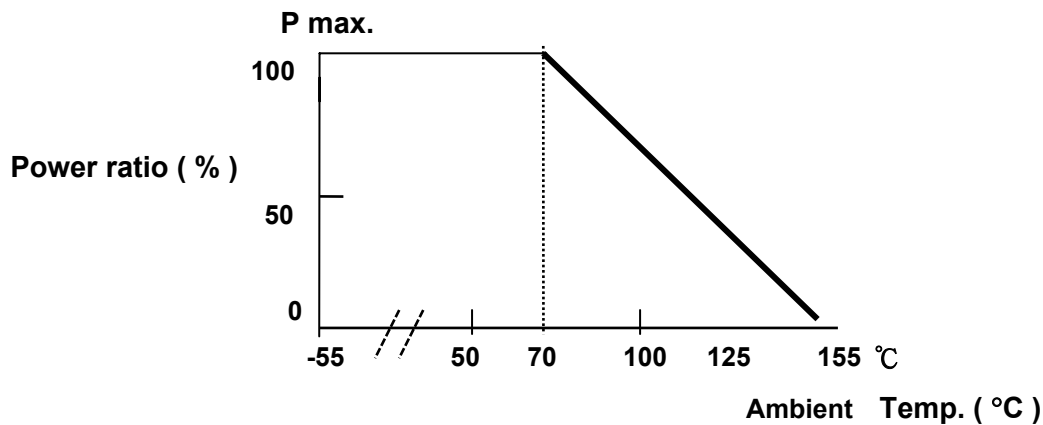


Figure 1



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 4/11

5.2 Rated Voltage:

The rated voltage is calculated by the following formula:

$$E = \sqrt{P * R}$$

E=Rated Voltage(V)

P=Rated Power(W)

R=Resistance Value(Ω)

E.G. : What is RMG06JT102 the rated voltage ?

RMG06JT102 P:1/10W ; R:102 = 1K Ω = 1000 Ω

$$E = \sqrt{0.10(W) * 1000(\Omega)} = 10.0 (V)$$



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 5/11

6. Reliability Tests:

Test Items	Reference standard	Condition of Test	Test Limits($\Delta R / R$)
Temperature Coefficient of Resistance	MIL-STD-202F Method 304 ; JIS-C5202-5.2	+25~ +125 °C	±100 PPM/°C
Short Time Overload	MIL-R-55342D -Para. 4.7.5; JIS-C5202-5.5	2.5 X rated voltage for 5 sec	D/F/G/J : ± (1% + 0.1Ω) Remark : 0402 Size : D/F/G/J : (±2% + 0.1Ω)
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. @ T=125°C. Unpowered. Measurement at 24±2 hours after test conclusion.	D/F /G/J: ±(2% + 0.1Ω)
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +125°C) Measurement at 24±2 hours after test conclusion.	D/F/G/J : ±(2% + 0.1Ω)
Moisture Resistance	MIL-STD-202 Method 106	1000 hrs , T=24 hours / Cycle . Notes : Steps 7a& 7b not required. Unpowered .	D/F/G/J: ±(2% + 0.1Ω)
Biased Humidity	MIL-STD-202 Method 103	1000 hours 85°C/85%RH. Note: Specified conditions: 10% of operating power. Measurement at 24±2 hours after test conclusion.	D/F/G/J : ±(3% + 0.1Ω)
Operational Life	MIL-STD-202 Method 108	1000 hours TA=125°C at rated power. Measurement at 24±2 hours after test conclusion. Remark : Specification of test PCB :By TA-I Mounted Q'ty : Mounted 2 pcs on 1 PCB .	D/F : ±(2% + 0.1Ω) G / J : ±(3% + 0.1Ω)
Resistance to Soldering Heat	MIL-STD-202 Method 210	Condition B : Immerse the specimens in and eutectic solder at 260±5°C for 10±1S .	D/F : ±(0.5% + 0.05Ω) G / J : ±(1% + 0.1Ω)
Solderability	J-STD-002	245±5°C solder, 2±0.5 sec dwell. Solder : Sn96.5 / Ag3.0 / Cu0.5	> 95% area covered with tin
Board Flex (Bending)	AEC-Q200-005	3mm deflection	D/F : ±(0.5% + 0.05Ω) G / J : ±(1% + 0.1Ω)
Terminal Strength (SMD)	AEC-Q200-006	Pressure X kgf a R0.5 pressure rod for 60 sec Force : 0402 : 0.5Kg 0805 : 1.0Kg 0603 : 0.5Kg 1206 : 1.8Kg	D/F : ±(0.5% + 0.05Ω) G / J : ±(1% + 0.1Ω)



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 6/11

7. Marking

7.1 ±2% & ±5%(E24) : RMG06/ RMG10 / RMG12

Resistance value is expressed by 3 digits, the first two digits represent the significant figures of nominal resistance value in Ω, and the third digit represents exponent for base of 10.

E.G. :, 102 = 10×10² = 1000 Ω = 1KΩ



7.2 ±0.5%,±1% (E96/E24) : RMG10 / RMG12

Resistance value is expressed by 4 digits or 3digits, the first three digits represent the significant figures of nominal resistance value in Ω, and the fourth digit represents exponent for base of 10.

E.G. : 1000 = 100×10⁰ = 100 Ω



7.3 ±0.5%,±1% (E96/E24): RMG06

When the marking space is too small in such small-sized resistors as RM06, the marking can not made by 4 digits and may be made by two digits combined with one English capital.

Symbol for E96 series nominal resistance value

Symbol	E96	Symbol	E96	Symbol	E96	Symbol	E96
01	100	25	178	49	316	73	562
02	102	26	182	50	324	74	576
03	105	27	187	51	332	75	590
04	107	28	191	52	340	76	604
05	110	29	196	53	348	77	619
06	113	30	200	54	357	78	634
07	115	31	205	55	365	79	649
08	118	32	210	56	374	80	665
09	121	33	215	57	383	81	681
10	124	34	221	58	392	82	698
11	127	35	226	59	402	83	715
12	130	36	232	60	412	84	732
13	133	37	237	61	422	85	750
14	137	38	243	62	432	86	768
15	140	39	249	63	442	87	787
16	143	40	255	64	453	88	806
17	147	41	261	65	464	89	825
18	150	42	267	66	475	90	845
19	154	43	274	67	487	91	866



General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 7/11

20	158	44	280	68	499	92	887
21	162	45	287	69	511	93	909
22	165	46	294	70	523	94	931
23	169	47	301	71	536	95	953
24	174	48	309	72	549	96	976

Symbol for multipliers

Symbol	A	B	C	D	E	F	G	H	X	Y	Z
multipliers	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁻¹	10 ⁻²	10 ⁻³

E.G : 01A = 100×10⁰ = 100Ω



Notes :

When the resistance value is not in the list of E96 , 3 digitals with underline in E-24 series is used as mark .

E.G.: 0603 , 120Ω , 1% Marking is 121

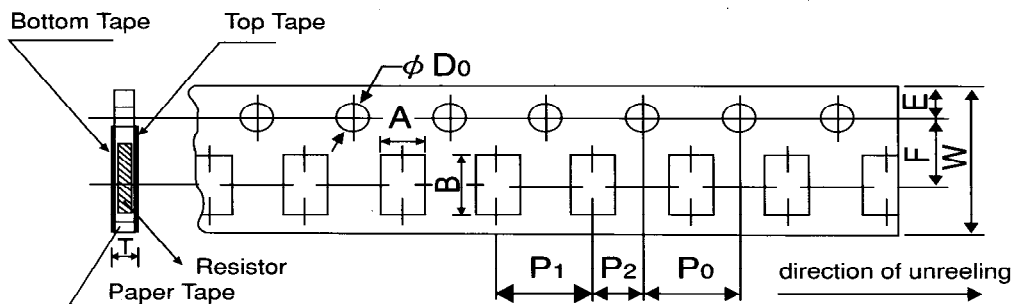


7.5 No Marking for RMG 04

8. Taping & Reel :

8.1 Taping Dimensions

8.1.1 4 mm pitch paper:



Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Paper	RMG06	1.1±0.1	1.9±0.1	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	φ 1.5 ^{+0.1} ₋₀	0.64±0.1
	RMG10	1.6±0.15	2.4±0.2								0.84±0.1
	RMG12	2.0±0.15	3.6±0.2								0.84±0.1



General Purpose Chip Resistors

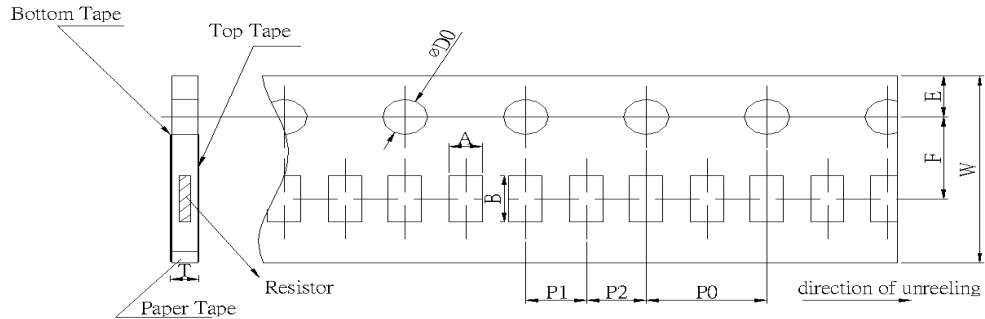
(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 8/11

8.1.2 2 mm pitch paper :



Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Paper	RMG04	0.7±0.05	1.2±0.05	8.0±0.2	3.5±0.05	1.75±0.1	2.0±0.1	2.0±0.1	4.0±0.1	φ 1.5	0.45±0.1
	RMG06	1.1±0.1	1.9±0.1				2.0±0.1	2.0±0.1			0.64±0.1

Package		Paper Tape	
		4 mm pitch	2 mm pitch
Type	Size	178mm/R	178mm/R
RMG	04		10000
RMG	06	5000	10000
RMG	10	5000	
RMG	12	5000	



General Purpose Chip Resistors

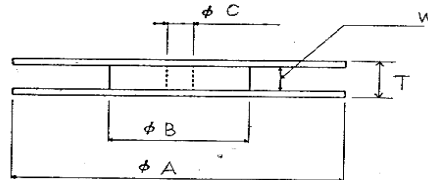
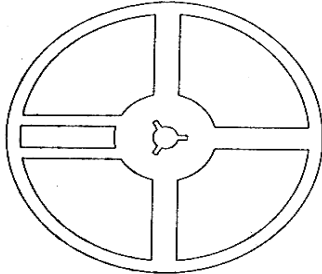
(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 9/11

8.2 Reel Specifications:

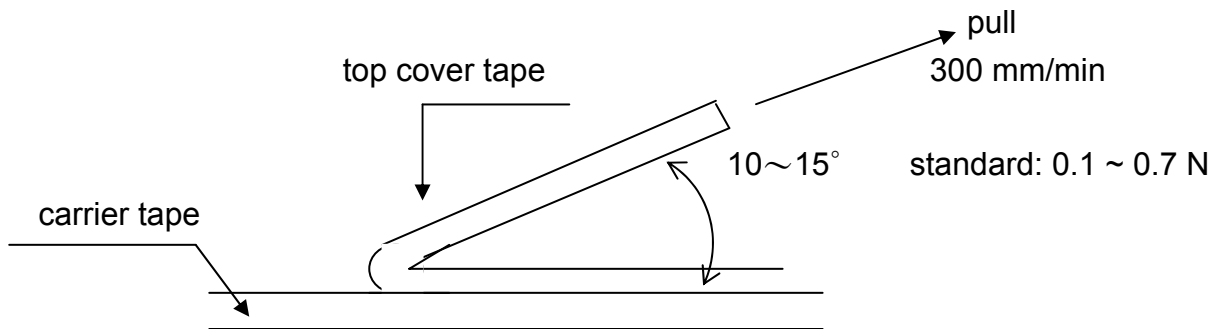


UNIT: mm

Type	ϕA	ϕB	ϕC	W	T
RMG 04 / 06 RMG10 / 12	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.5 ± 1.0

8.3. Peel –off force :

Peel –off force of paper and blister tape is in accordance with “JIS-C5202 ”
that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.





General Purpose Chip Resistors

(Lead-Free for RMG 04/06/10/12 series Standard)

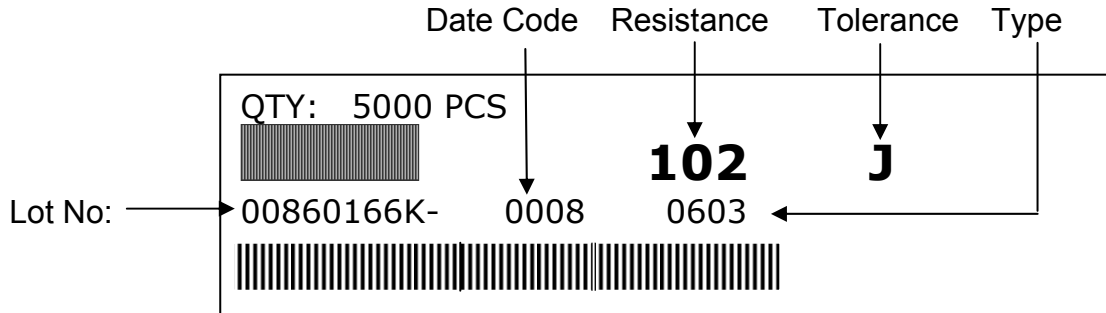
Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

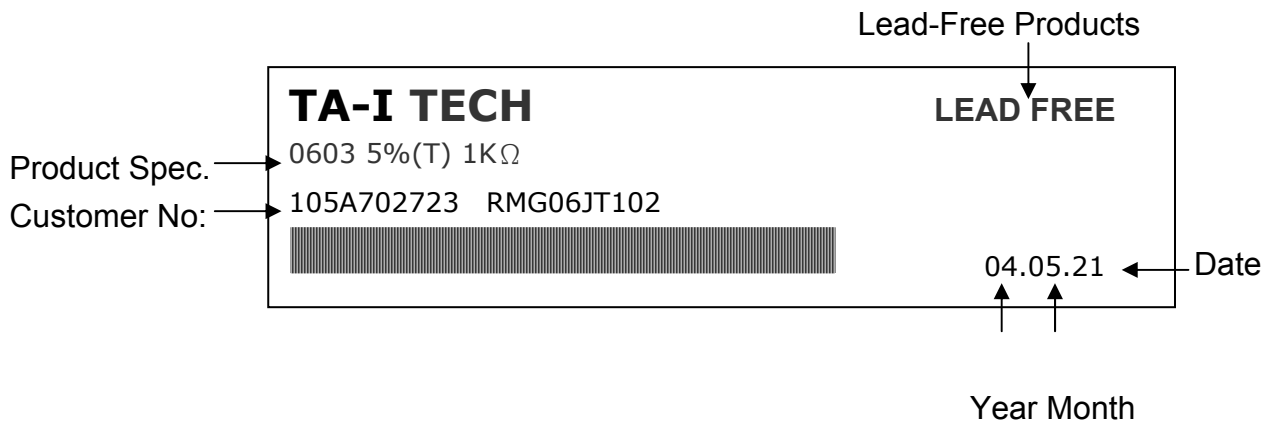
page number 10/11

9. Label :

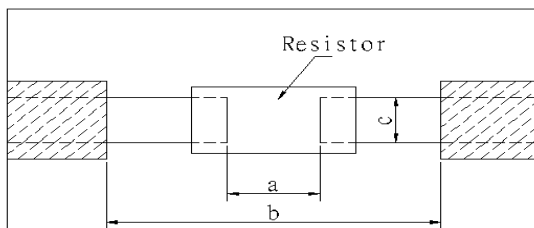
9.1 Manufacture Label :



9.2 Customer Label (By customer request):



10. Recommended land patterns :



Type	Size	Land pattern		
		Dimension (mm)		
		a	b	c
RMG	04 (0402)	0.50~0.6	2.0	0.5
RMG	06 (0603)	0.7~0.9	3.2	1.2
RMG	10 (0805)	1.0~1.4	4.0	1.65
RMG	12 (1206)	2.0~2.4	5.5	2.0



General Purpose Chip Resistors

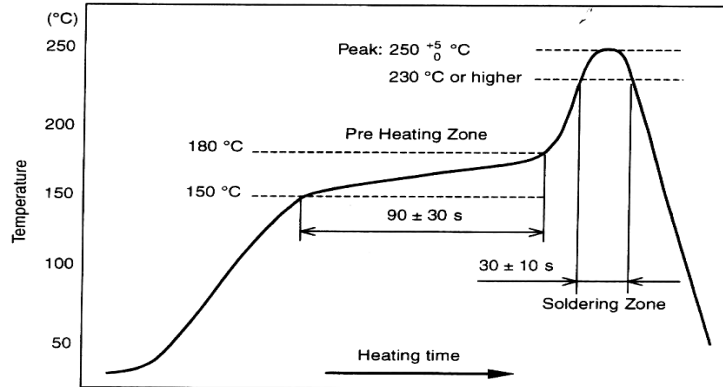
(Lead-Free for RMG 04/06/10/12 series Standard)

Document No. TRMG-XXRMG001A

Issued Date 2008/12/23

page number 11/11

11. Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)



Peak : 250 $\begin{smallmatrix} +5 \\ -0 \end{smallmatrix}$ °C , 5 sec

Pre – heat Zone : 150 to 180 °C , 90±30 sec

Soldering Zone : 230°C or higher , 30±10 sec

12. Storage Conditions:

Temperature: 5°C~35°C, Humidity:40%~75%

13. Shelf Life:

2 years from manufacturing date.