



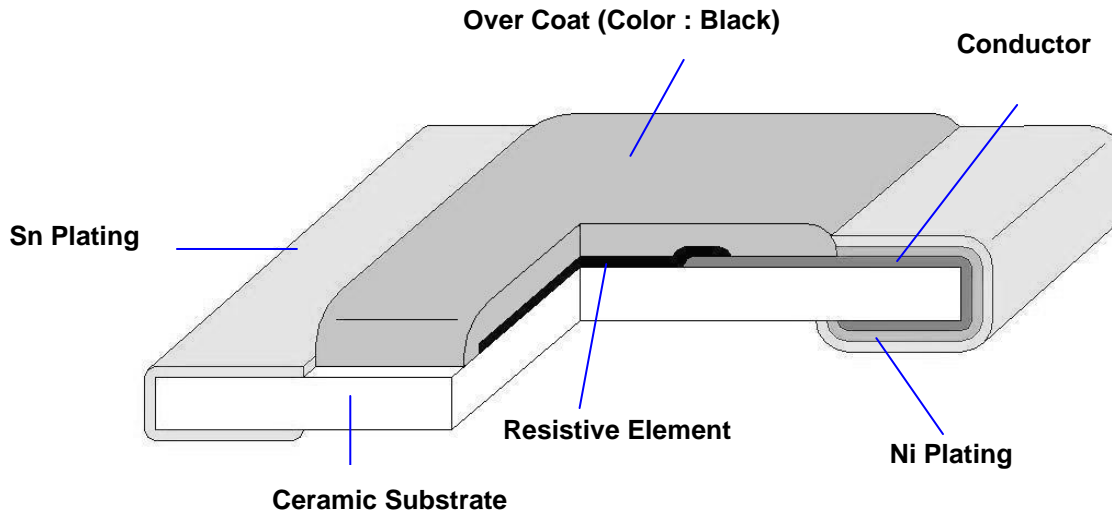
Anti-Surge Chip Resistors (Lead-Free for RAS series standard) Halogen-Free

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1. Scope :

This specification applies for the RAS25 series of Anti-Surge chip resistors made by TA-I.

2. Construction :



3. Type Designation :

<u>RAS</u>	<u>25</u>	<u>J</u>	<u>EN</u>	<u>470</u>
Product Code	Size	Tolerance	Packaging	Nominal
RAS : Anti-Surge Chip Resistor	Power Rating	Resistance		

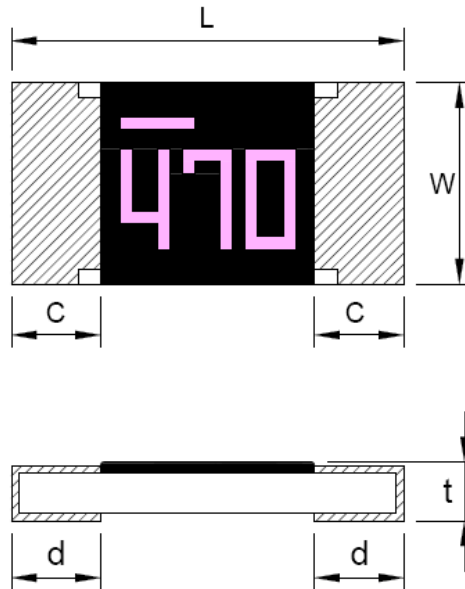
25-2512(6432) 1W	J-±5% k-±10%	E- Embossed tape N-Lead Free	3 digits, e.g.,: (E-24) 470 = 47Ω
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4. Dimensions :



UNIT: mm

Type	L	W	C	d	t
RAS25	6.30±0.20	3.20±0.20	0.60±0.30	0.50±0.25	0.60±0.10

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)	
						J(±5%) E-24	k(±10%) E-24
RAS25	1W	Refer 5.2	200V	400V	±400	1Ω-9.1Ω	1Ω-9.1Ω
					±100	10Ω-100KΩ	1Ω-100KΩ
Operating Temp (°C) : -55°C ~ +155°C							

Note : Except for the above standardized products, we also provide the customized products.



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5.1. Derating Curve :

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

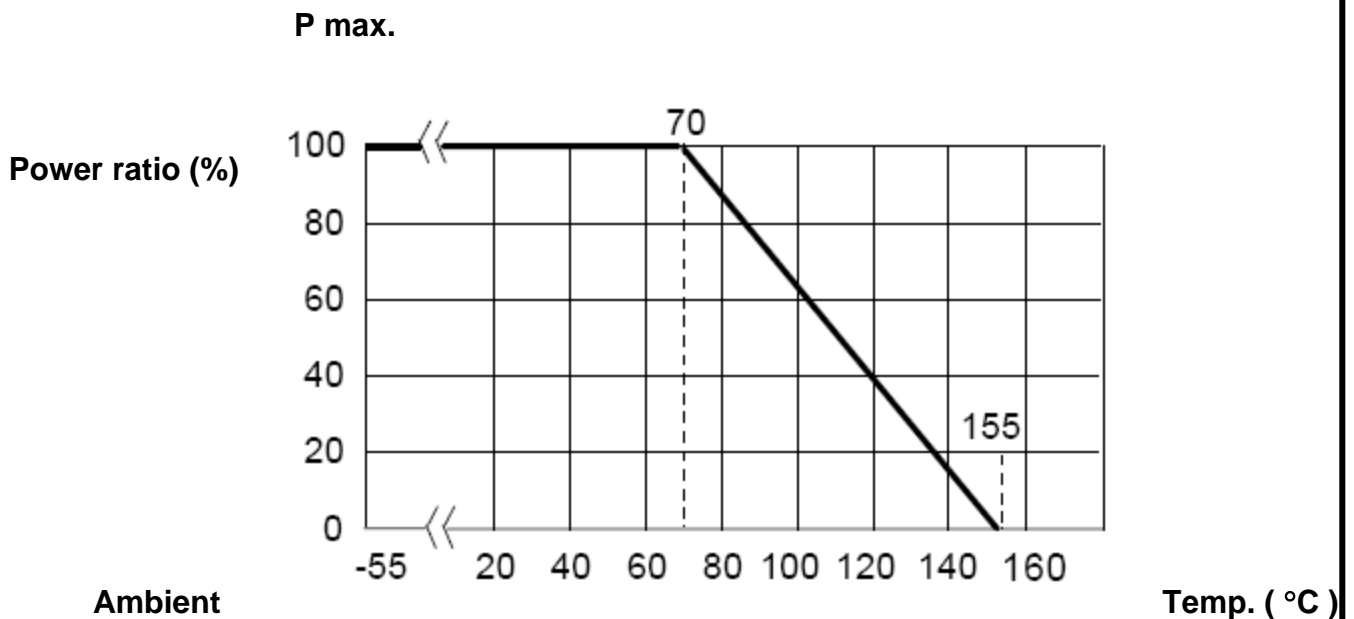


Figure 1

5.2. Rated Voltage :

The rated voltage is calculated by the following formula:

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

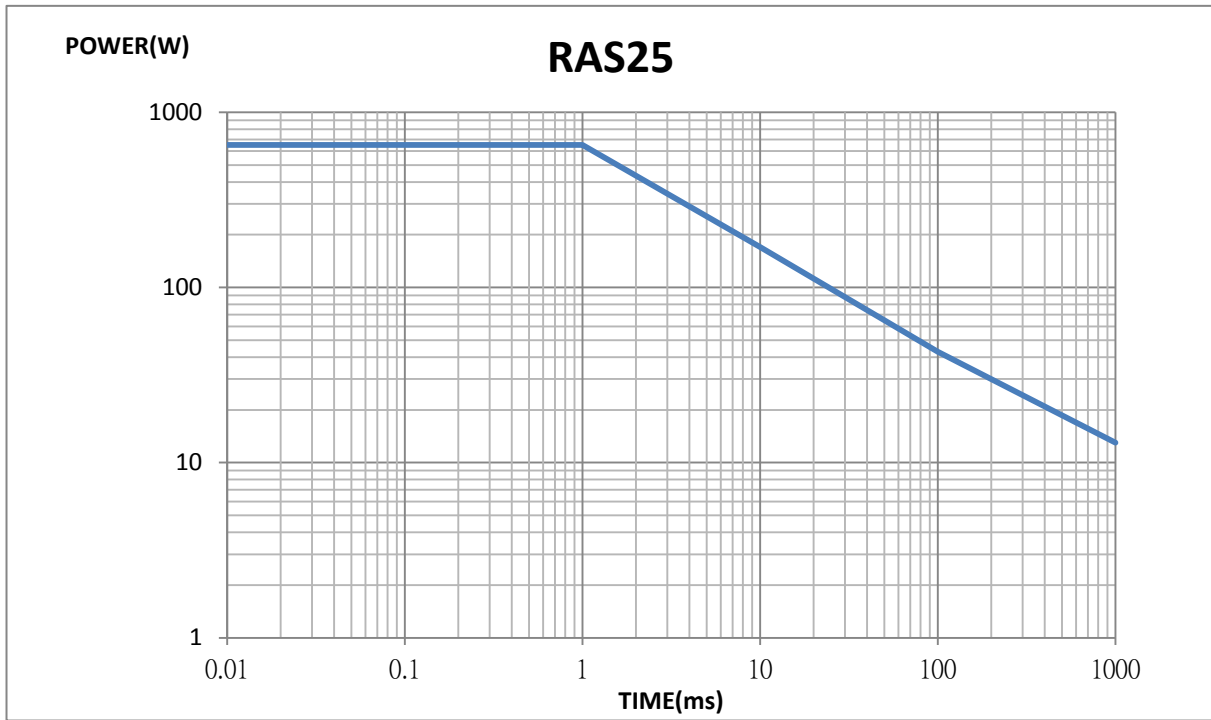
E=Rated Voltage(V)
P=Rated Power(W)
R=Resistance Value(Ω)



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5.3. Single Pulse Limiting Power Curve :





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6. Reliability Tests :

Test Items	Reference standard	Condition of Test	Test Limits ΔR
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55~ +125 °C	Refer 5.0
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage for 5 sec	$\pm(1.0\% + 0.05\Omega)$
Intermittent Overload	IEC60115-1-4.39 JIS-C5201-1-4.39	2.5 X rated voltage or Max Overloading voltage ,1sec "ON" , 25sec "OFF" ,10000 cycles	$\pm (5.0\% + 0.1\Omega)$
Endurance (Load Life)	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 hours at rated voltage, 70°C , 1.5hours "ON" , 0.5hour "OFF"	$\pm(3.0\%+0.1\Omega)$
Load Life with Humidity	IEC60115-1-4.24 JIS-C5201-1-4.24	1000 hours at rated voltage , 40 \pm 2°C , 90~95% RH 1.5hours "ON" , 0.5hour "OFF"	$\pm(3.0\%+0.1\Omega)$
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55°C (30 min.) / +155 °C(30 min.) 5 cycles	$\pm(1.0\%+0.05\Omega)$
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	245 \pm 5°C solder, 2 \pm 0.5 sec dwell. Solder : Sn96.5 / Ag3.0 / Cu0.5	At least 95% of surface area of electrode shall be covered with new solder.
Robustness of Termination (Bending)	IEC60115-1-4.33 JIS-C5201-1-4.33	3mm deflection	$\pm(1.0\%+0.05\Omega)$
Dielectric Withstanding Voltage (Voltage Proof)	IEC60115-1-4.7 JIS-C5201-1-4.7	Applying voltage : The 500V for a minute .	No abnormalities such as flashover, burning dielectric breakdown shall appear.
Insulation Resistance	IEC60115-1-4.6 JIS-C5201-1-4.6	Applying voltage 100V for 1 minute.	$\geq 1G\Omega$
Resistance to Dry Heat	IEC60115-1-4.23.2 JIS-C5201-1-4.23.2	155 \pm 5°C for 96 \pm 4Hrs	$\pm(2.0\%+0.1\Omega)$
Resistance to Solder Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 \pm 5°C solder , 10 \pm 1 sec dwell .	$\pm(1.0\%+0.05\Omega)$

Note* : RCWV : Rated continuous working voltage .



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7. Marking

7.1 ±5% , ±10%(E24) :

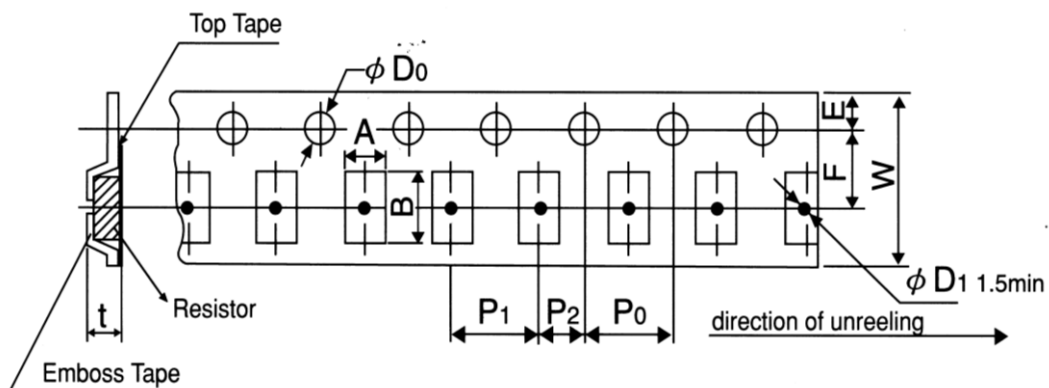
Resistance value is expressed by 3 digits, the first two digits represent the significant figures of nominal resistance value in Ω , and the third digit represents exponent for base of 10.

E.G. :, 100 = $10 \times 10^0 = 10 \Omega$



8. Taping & Reel :

8.1.1 4 mm pitch Emboss



Packing	Type	A	B	W	F	E	P1	P2	P0	D0	T
Emboss	RAS25	3.6±0.2	6.9±0.2	12.0±0.2	5.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.05	ϕ 1.5 ^{+0.1} ₋₀	0.85 ±0.15

UNIT: mm

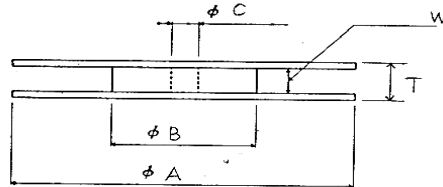
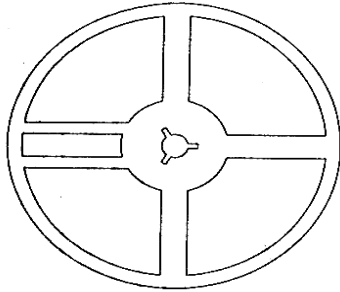
Type Size		Emboss Plastic Tape	
		4 mm pitch	
RAS	25	4000	



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8.2 Reel Specifications:

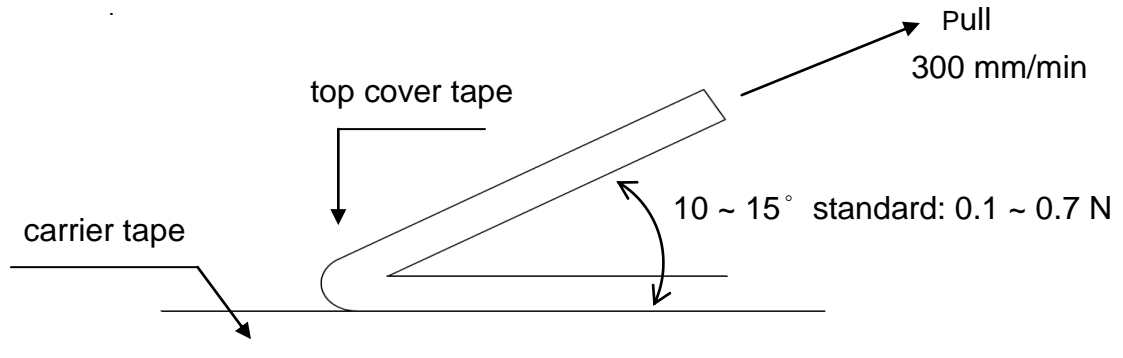


UNIT: mm

Series	ϕA	ϕB	ϕC	W	T
RAS 25	178 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	13.0 ± 1.0	15.5 ± 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.



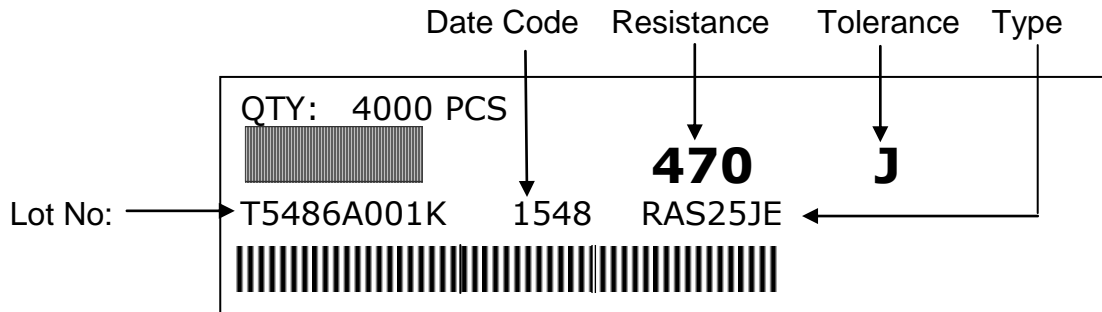


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9. Label :

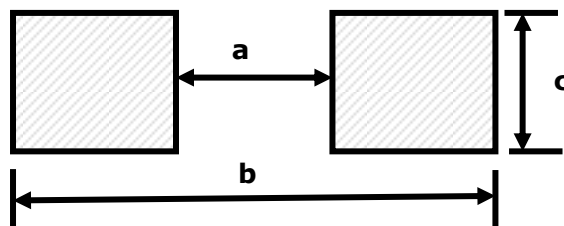
9.1 Manufacture Label :



9.2 Customer Label (By customer request):



10. Recommended land patterns :



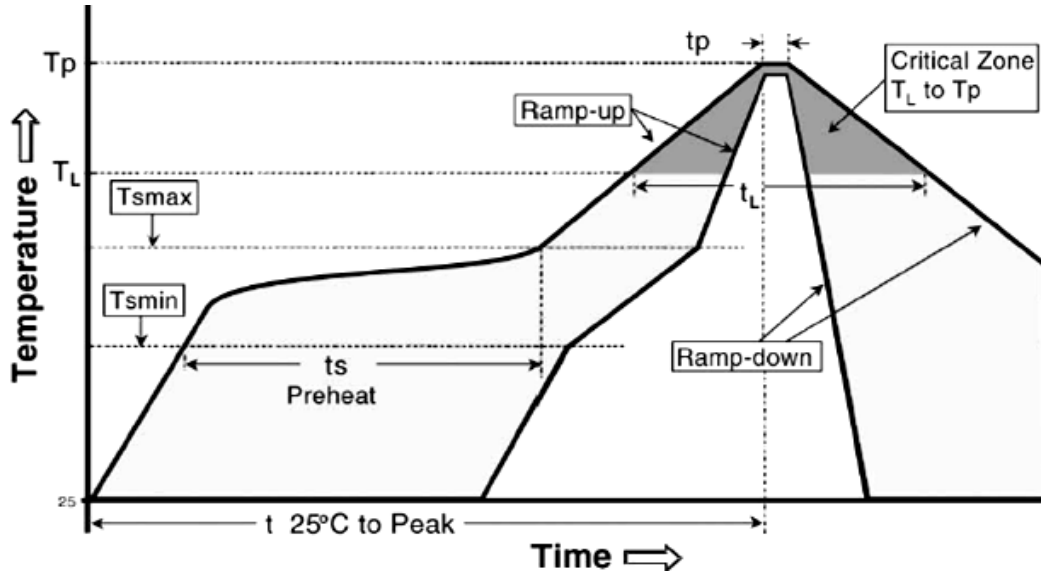
Type	Size	Land pattern		
		Dimension (mm)		
		a	b	c
RAS	25 (2512)	3.6~4.0	7.6~8.6	2.3~3.5



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



Profile Feature	Lead (Pb)-Free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C / second max.
Preheat - Temperature Min (Tsmin) - Temperature Max (Tsmax) - Time (Tsmin to Tsmax) (ts)	150°C 200°C 60 -150 seconds
Time maintained above : - Temperature (Tl) - Time (tL)	217°C 60-120 seconds
Peak Temperature (Tp)	260°C
Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak Temperature (tp) ²	10 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8minutes max.

Allowed Re-flow times : 3 times

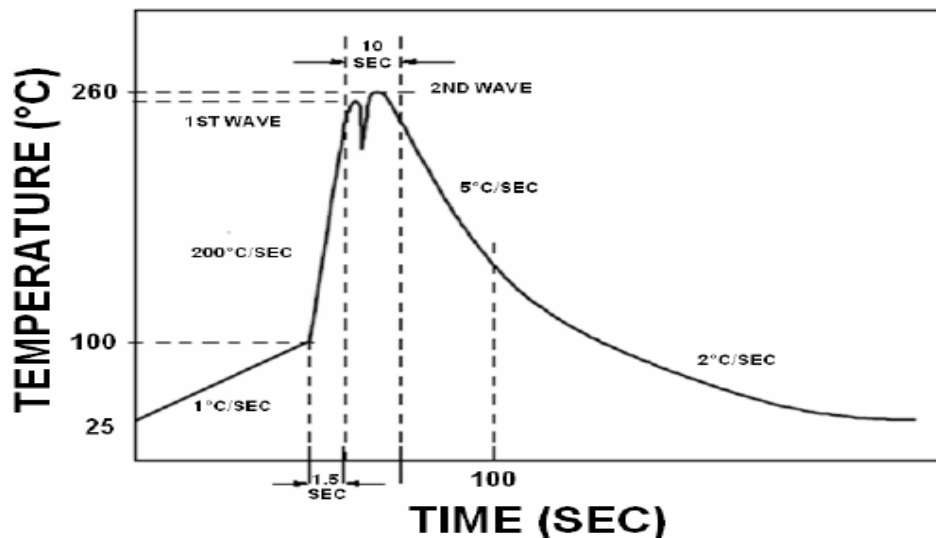
Remark : To avoid discoloration phenomena of chip on terminal electrodes,
 please use N2 Re-flow furnace .



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12. Recommend Wave-Solder profile : (solder : Sn96.5 / Ag3 / Cu0.5)



13. Solder iron conditions:

Bit temperature : $350 \pm 10^{\circ}\text{C}$

Application time of soldering iron : 3 sec

The number of times of work: 1 time

14. Storage Conditions:

Temperature: $5^{\circ}\text{C} \sim 35^{\circ}\text{C}$, Humidity: 40%~75%

15. Shelf Life:

2 years from manufacturing date.

16. ECN :

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.



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17. Manufacturing Country & City :

TA-I TECHNOLOGY CO., LTD. (Taiwan– Tao Yuan)
Tel: 886-3-3246169 Fax : 886-3-3246167

TA-I TECHNOLOGY (SU ZHOU) CO., LTD. (China – Su Zhou)
Tel :86- 512-63457879 Fax : 86-512-63457869

Associated companies :

(1) FORTUNE TASK RESISTOR FACTORY (China – Dongguan)
Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(2) TA-I TECHNOLOGY ELECTRONIC (DONGGUAN) CO., LTD. (China –Dongguan)
Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(3) TAI OHM ELECTRONICS (M) SDN. BHD. (Malaysia –Penang)
Tel :604- 3900480 Fax : 604-3901481

(4) P.T.TAI ELECTRONICS Indonesia (Indonesia – Jakarta)
Tel :62-21-89830123 Fax : 62-21-89830703