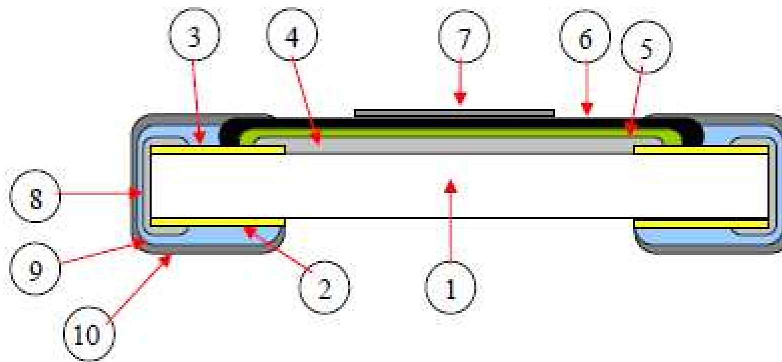
華新科技股份有限公司
Walsin Technology Corporation

Chip-R
Application Guide

Constructions



NO.	Product Structure	Material name
1	Substrate	Ceramic Al2O3
2	Backside electrode	Ag
3	Top side electrode	Ag/Pd
4	Resistive layer	RuO_2
5	Primary coating	Glass
6	Protective coating	Resin
7	Marking	Silan compound
8	Sputtering end termination	NiCr
9	Plating Ni	Ni
10	Plating Sn	Matte Sn

Storage and handling Conditions

1. Products are recommended to be used up within one year. To check solderability in case shelf life extension is needed.
2. To store products with following conditions:

   Temperature: 5 to 40 ℃

   Humidity: 20% to 70% relative humidity
3. Caution:
   a. Do not store products in a corrosive environment such as sulphide, chloride gas or acid. It may cause oxidization of electrode which easily be resulted in poor soldering.
   b. To store products on the shelf and avoid exposure to moisture.
   c. Do not expose products to excessive shock, vibration, direct sunlight and so on.

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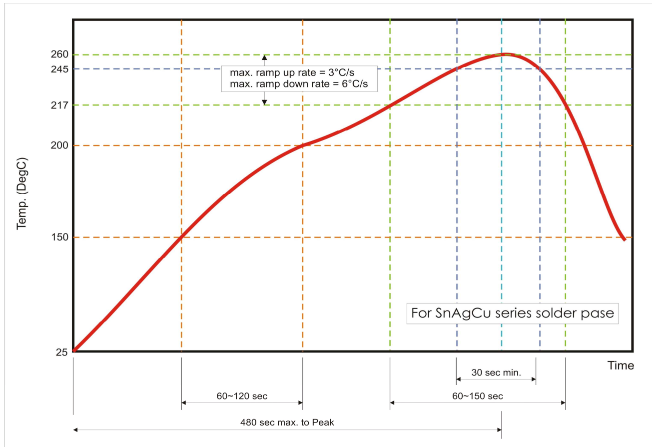
Recommendation of Soldering Profiles:

In general application, the lead free (Pb-free) termination CRs are used and may be mounted on PCB by IR reflow or wave soldering process with lead-free solder material. The recommended soldering profiles are shown as Fig.1 & 2. The lead-free termination CRs are also suitable on SMT process against lead-containing solder paste. But the soldering temperature should be higher than the melting point of solder paste 30℃ at least.



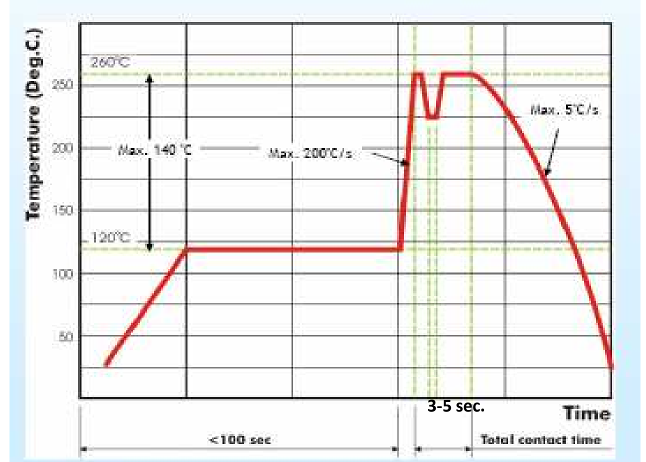


Fig. 2 Recommended wave soldering profile for SMT process with SnAgCu series solder.

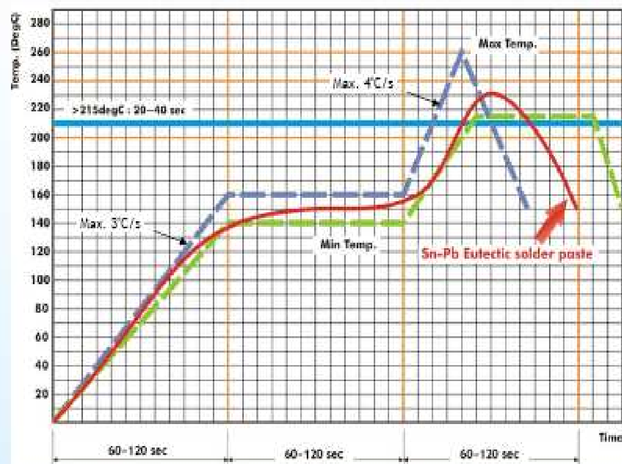


Fig. 3 Recommended reflow soldering profile for SMT process with eutectic SnPb solder paste.

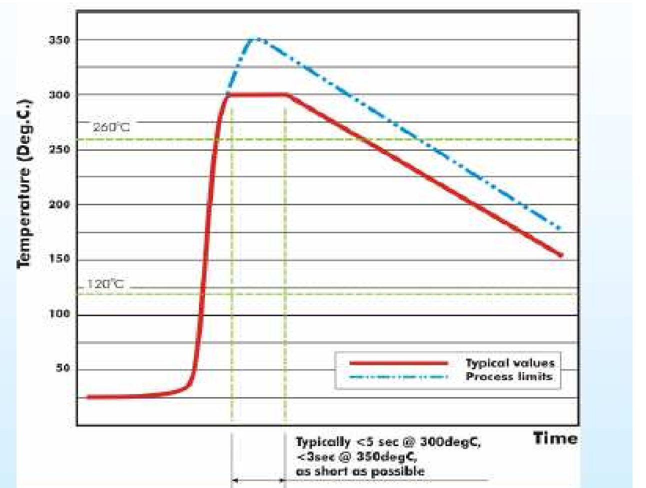
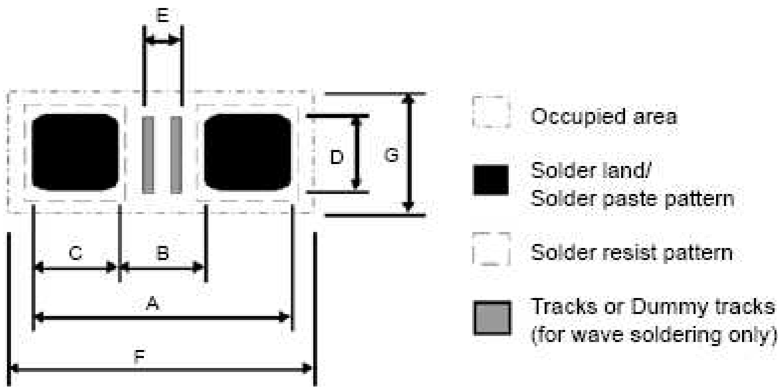


Fig. 5 Recommended soldering profile by manual with SnAgCu series solder material.

Footprint Design for Chip Resistor and Array



unit: mm

Size	Reflow Soldering							Processing Remarks	Placement Accuracy
	A	B	C	D	E	F	G		
01005	0.58	0.18	0.20	0.20	0.10	0.90	0.40	IR or hot plate soldering	±0.03
0201	0.75	0.30	0.30	0.30	0.20	1.10	0.50		±0.05
0402	1.50	0.50	0.50	0.60	0.10	1.90	1.00		±0.15
0603	2.10	0.90	0.60	0.90	0.50	2.35	1.45		±0.25
0805	2.60	1.20	0.70	1.30	0.75	2.85	1.90		±0.25
1206	3.80	2.00	0.90	1.60	1.60	4.05	2.25		±0.25
1210	3.80	2.00	0.90	2.80	1.60	4.05	3.15		±0.25
1218	3.80	2.00	0.90	4.80	1.40	4.20	5.50		±0.25
2010	5.60	3.80	0.90	2.80	3.40	5.85	3.15		±0.25
2512	7.00	3.80	1.60	3.50	3.40	7.25	3.85		±0.25
Size	Wave Soldering							Processing Number & Dimensions of dummy tracks	Placement Accuracy
	A	B	C	D	E	F	G		
0603	2.70	0.90	0.90	0.80	0.15	3.40	1.90	1x (0.15 x 0.80)	±0.25
0805	3.40	1.30	1.05	1.30	0.20	4.30	2.70	1x (0.20 x 1.30)	±0.25
1206	4.80	2.30	1.25	1.70	1.25	5.90	3.20	3x (0.2 5x 1.70)	±0.25
1210	4.80	2.30	1.25	2.50	1.25	5.90	3.60	3x (0.2 5x 1.70)	±0.25
1218	4.80	2.30	1.25	4.80	1.30	5.90	5.60	3x (0.25 x 4.80)	±0.25
2010	6.30	3.50	1.40	2.50	3.00	7.00	3.60	3x (0.75 x 2.50)	±0.25
2512	8.50	4.50	2.00	3.20	3.00	9.00	4.30	3x (1.00 x 3.20)	±0.25

■ Footprint Design for Array Resistor/Attenuator :

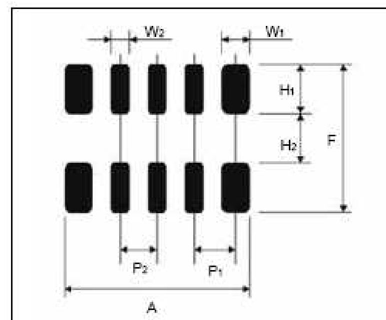
Unit: mm

Symbol	0603*4 array	0402*4 array	WA04Y, WA04P	WA06W	WA02Y
A	2.85+0.10/-0.05	1.80+0.15/ -0.05	1.20±0.05	3.85+0.20/ -0.05	1.00±0.05
B	0.45±0.05	0.30±0.05	0.40 +0/ -0.05	0.28 +0/ -0.05	0.40 +0/ -0.05
D	0.80±0.10	0.50±0.10	0.50±0.05	1.00 +0.1/ -0.20	0.30±0.05
P	0.8	0.5	0.65	0.5	0.5
F	3.10±0.30	2.00+0.40/ -0.20	1.5 +0.20/ -0.10	3.20±0.40	1.0±0.10

■ Footprint Design for 10P8R Network Resistor :

Unit: mm

Symbol	WT04X
W1	0.50 ± 0.05
W2	0.35 ± 0.05
H2	0.80 ± 0.10
P1	0.70 ± 0.05
P2	0.65 ± 0.05
A	3.20 ± 0.10
F	2.80 + 0.40 / - 0.20



Precaution of Soldering

1. It is recommended to use a mildly activated rosin flux (less than 0.1% wt chlorine)
2. Excessive flux must be avoided
3. When water-soluble flux is used, enough washing is necessary
4. Two times limitations for reflow soldering is highly recommended
5. Solder repair by soldering iron
   a. max. 350℃ for below 3 seconds is highly recommended
   b. Do not directly contact termination to avoid thermal shock
6. Prevent any external force on the products until solder is cooled

Washing

1. Confirm the ionic residues in solder do not remain after washing for moisture resistance and corrosion resistance may cause deterioration when these substances are attached to the products.
2. Confirm the reliability in advance when using no washing solder, water or soluble agent.
3. Wash thoroughly after soldering to remove ionic substances like sweat and salinity.
4. The ultrasonic washing may destruct the products due to resonance by vibration. High hydraulic pressure may also damage the products.
5. Dry the products sufficiently after washing.

Mounting

1. Imperfect adjustment of mounting machine may cause the cracks, the chipping and the alignment error. Check and inspect the mounting machine in advance.
2. Set the backup pins in proper layout otherwise the components mounted on the backside of the board are damaged. Do not set these pins at the position of the nozzle.
3. Adjust the bottom dead point of dispenser away from the board when you apply adhesive.
4. Confirm that the products are corresponding to flow soldering when you perform it.
5. Pay attention to the amount of solder because improper amount of solder place large stress on the products and cause cracks or malfunctions.