



APPROVAL SHEET

ASHP-K SERIES

Alloy Shunt

Version	Date	Description of amendment	Draft	Checked
A1.0	20-Dec.-2022	First issue	Jiamiao Wang	Ziyang Hu
A1.1	16-Jan.-2024	Increase the partial resistance	Jiamiao Wang	Ziyang Hu
A1.2	18-Mar.-2024	1、 Adjust the pin length (A) dimensions of the 5930 package product and the corresponding recommended PCB layout (a) dimensions, 2、 Add product (B) size description.	Jiamiao Wang	Ziyang Hu
A1.3	15-Sep.-2025	1、 Delete the 2512 package. 2、 Modify the technical parameter data 3、 Revise the content of the durability test	Zhijun Jiang	Xiaohui Deng

1. Product Description

Product name: ASHP-K series

Description: ASHP-K series Alloy Shunt provide precise current sensing with low TCR and high power, ideal for automotive and industrial applications.

1.1 Part Number Explanation

The part number of the high power precision resistor is identified by the type name, Resistance Alloy, tolerance, TCR, Dimension and resistance value.

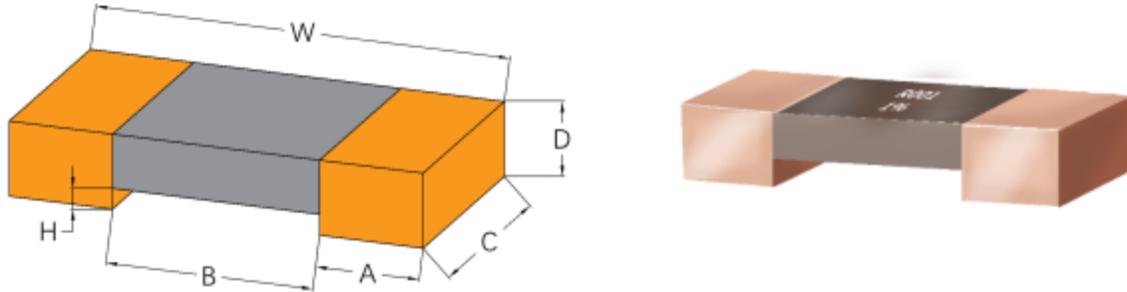
Example: ASHP-K-5-1F-L

Type	Resistance Alloy	Dimension	Resistance Value	Tolerance	TCR
ASHP	K=Karma	5=3920 7=5930 Unit: in	1 Unit: mΩ	D=± 0.5% F=± 1% G=± 2% J=± 5%	L=± 10 P=± 20 Q=± 30 Unit: ppm/°C

- (1) **Type name:** ASHP series
- (2) **Resistance Alloy:** K=Karma
- (3) **Dimension:** 5=3920; 7=5930
- (4) **Resistance:** 1
- (5) **Tolerance:** D=±0.5%; F=±1%; G=±2%; J=±5%
- (6) **TCR:** L=±10; P=±20; Q=±30



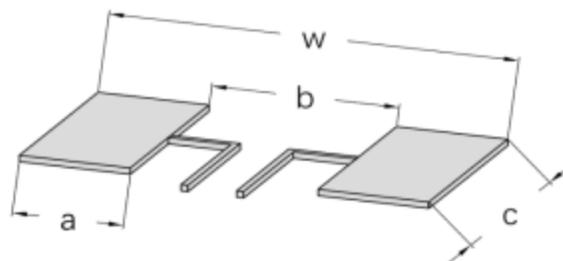
1.2 Products Dimension



(Unit: mm)

Type	Size (in)	W	A	C	B	H
ASHP-K	3920	10.0±0.2	2.0±0.3	5.2±0.3	6.0±0.2	0.3-0/+0.3
	5930	15.0±0.3	4.3±0.3	7.6±0.4	6.4±0.2	0.3-0/+0.3

1.3 PCB-layout (Reflow-soldering)



(Unit: mm)

Solder pad type	w	c	a	b
ASHP-K-3920	11	6	2.7	5.6
ASHP-K-5930	16	8.5	5	6

2. Technical Data

Size	Resistance Alloy	Resistance Range(m Ω)	Resistance Value(m Ω)	D \pm 0.1 (mm)	*TCR (ppm/ $^{\circ}$ C)	P70 $^{\circ}$ C (W)
3920	K	1~4	1	1.7	\pm 10	9
					\pm 20	
					\pm 30	
			2	1	\pm 10	7
		\pm 20				
		3	0.8	\pm 10	6	
				\pm 20		
		4	0.8	\pm 20	5	
5930		0.8~3	0.8	1.7	\pm 30	10
			1	1.4	\pm 20	9
					\pm 30	
			2	1.0	\pm 20	8
3	0.8	\pm 20	7			

TCR (ppm/ $^{\circ}$ C) : Test was conducted with the temperature from -20° C to 120° C , while 20° C worked as reference.

Note: Unless the resistance value is specified, the temperature drift can generally reach ± 20 ppm.

3. Endurance Test

Items	Additional Requirements	Reference	Limits
High Temperature Exposure	1000 hrs. (T= 170° C) , unpowered. Measurement at 24 ± 4 hours after test conclusion .	MIL-STD-202 Method 108	$\pm 0.5\%$

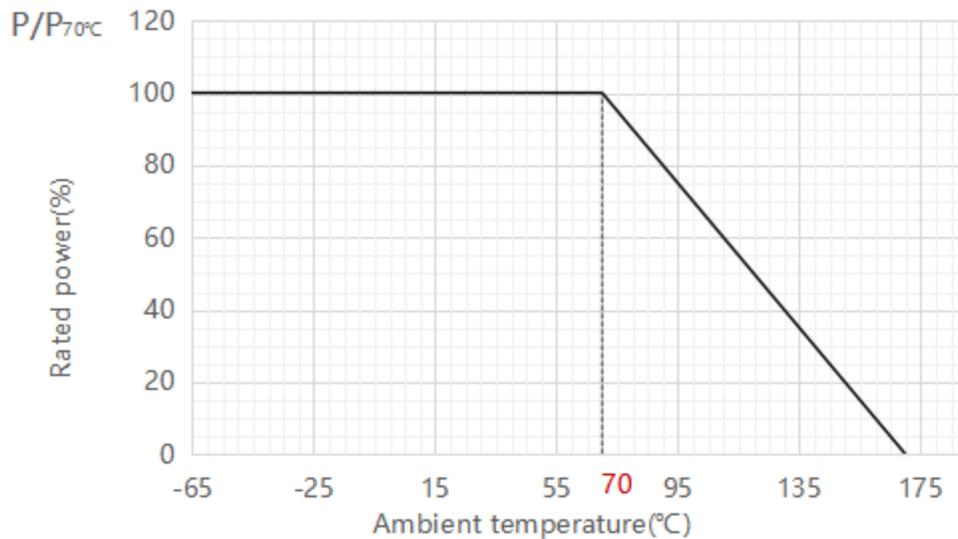


Temperature Cycling	1000 Cycles(-55°C to +150°C), unpowered. Minimum dwell time 15min. at each temperature extreme. maximum transition time 1 min. . Measurement at least 24 hours after test conclusion .	JESD22-A-104	±0.5%
Humidity Bias	1000hrs. (85°C /85%RH) . Note: Specify conditions: 10% of operating power. Measurement at 24± 4 hours after test conclusion .	MIL-STD-202 Method 103	±0.5%
High Temperature Operating Life	1000 hrs. (T=125°C). Rate power was applied to the products intermittently: 90 minutes ON and 30 minutes OFF . Measurement at 24± 4 hours after test conclusion .	MIL-STD-202 Method 108	±0.5%
Resistance to Soldering Heat	250°C±5°C , 30s±5s	MIL-STD-202 Method 210	±0.5%
Solderability	Weld bath temperature 245°C±5°C, duration 5±0.5S .	J-STD-002	95% Coverage Minimum
Vibration	20 min.(5 g's) , test from 10Hz-2000 Hz, 12 cycles each of 3 orientations .	MIL-STD-202 Method 204	±0.5%
Board Flex Test	Apply an external force once to the circuit board, bend at least Dx = 2mm, duration 60±5 S .	AEC-Q200-005	±0.5%
Terminal Strength (SMD)	Apply an external force once to the side of the test device, the force is 17.7N (1.8kg), duration 60±1S .	AEC-Q200-006	±0.5%
Mechanical Shock	1) Pulse waveform: Half-Sine pulse; 2) Accelerate peak: 100g's; 3) Pulse duration: 6ms; 4) Orientation & Shock time: ±X, ±Y, ±Z, 3 times each orientation, total 18 times .	MIL-STD-202H Method 213	±0.5%
ESD	1) Direct Contact (DC): ±6kV ; 2) Air Discharge (AD): ±12kV, ±16kV, ±25kV .	AEC-Q200-002 REV-B	±0.5%



Flame Retardance	1) Test current: 100%, 115%, 130%, 150% (Rate current); 2) Test duration: 1h .	AEC-Q200-001	The following constitutes a failure : : 1)A flame over 3.0 seconds duration; 2)An explosion: 3) A temperature above 350°C sustained for over 10 seconds.
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4. Power Derating Curve

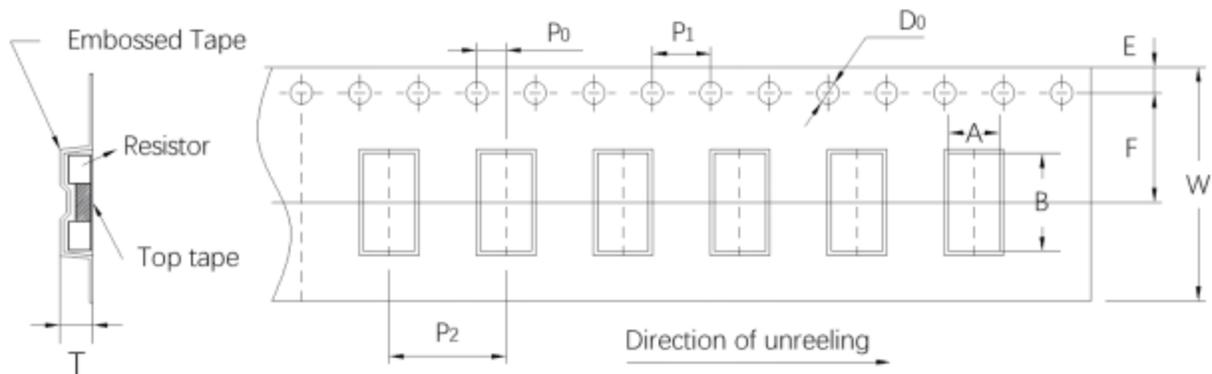


5. Marking



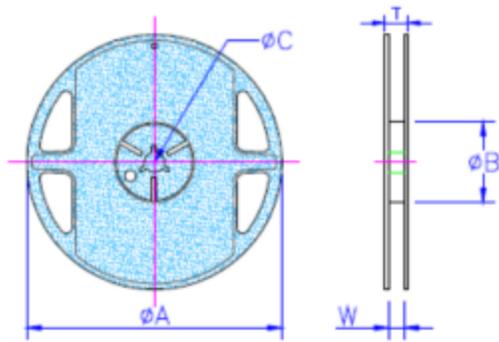
Mark	Explanation
R001	R001: 1mΩ (Value 阻值)
1%	1%: ± 1% (Tolerance 精度)
0m80	0m80: 0.8mΩ (Value 阻值)
0.5%	0.5% : ± 0.5% (Tolerance 精度)

6.Packing



Unit/mm

Size	A± 0.15	B± 0.15	W± 0.3	E± 0.1	F± 0.1	P0± 0.1	P1± 0.1	P2± 0.1	D0± 0.1	T±0.2	Quantity (pcs)
3920	5.7	10.5	24	1.75	11.5	2	4	12	1.50	It depends on the height of the product D size.	2500
5930	8.1	15.5	24	1.75	11.5	2	4	12	1.50		2000



Size	3920	5930
φA	330	330
φB	100	100
φC	13	13
W	24.5	24.5
T	29	29

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