APPROVAL SHEET

ASH-M-3 SERIES

Alloy Shunt

Version	Date	Description of amendment	Draft	Checked
A1.0	8-Nov-2023	First issue	Jiamiao Wang	Ziyang Hu
A1.1	22-Nov-2023	Correction of the thickness (D) dimensions of the product	Jiamiao Wang	Jiamiao Wang

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1.Product Description

Product name:ASH-M-3 series

Description:ASH-M-3 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, special id,Dimension and resistance value.

Example: ASH-M-3-1F-DP

Type	Resistance Alloy	Dimension	Resistance Value	Tolerance	Special ID
ASH	M=Manganin	3=2512 Unit：in	1 Unit：mΩ	D=±0.5% F=±1% J=±5%	DP

(1) **Type name:** ASH series

(2) **Resistance Alloy:**M=Manganin

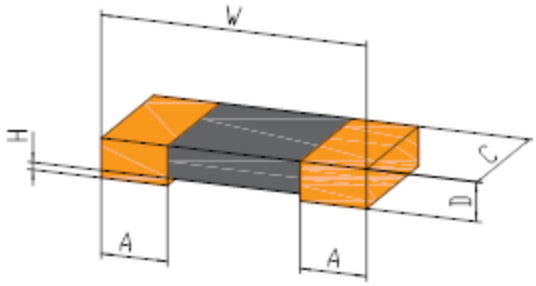
(3) **Dimension:**3=2512

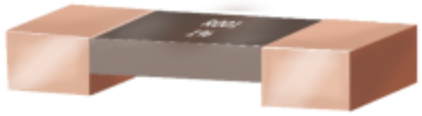
(4) **Resistance：**1

(5) **Tolerance：**D=±0.5%;F=±1%;J=±5%

(6) **Special:DP**

1.2 Products Dimension

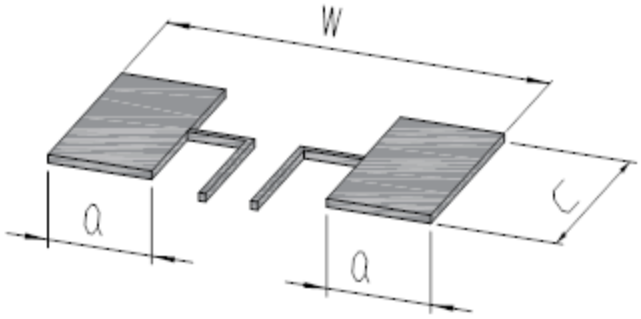




(Unit: mm)

Type	Size	W (mm)	A (mm)	C (mm)	H (mm)
ASH-M-3	2512	6.3±0.2	1.2±0.2	3.1±0.3	≥0.3

1.3 PCB-layout (Reflow-soldering)



(Unit: mm)

Solder pad type	w	c	a
ASH-M-3	7	3.8	1.8

2. Technical Data

Size (in)	Element material	Resistance (mΩ)	D±0.15 (mm)	*TCR (ppm/℃)	P70° C (W)
2512	Manganin	0.5	1.5	±50	6
		1.0	1.0	±50	6

***TCR（ppm/℃）： Test conditions at -40℃~+150℃；**

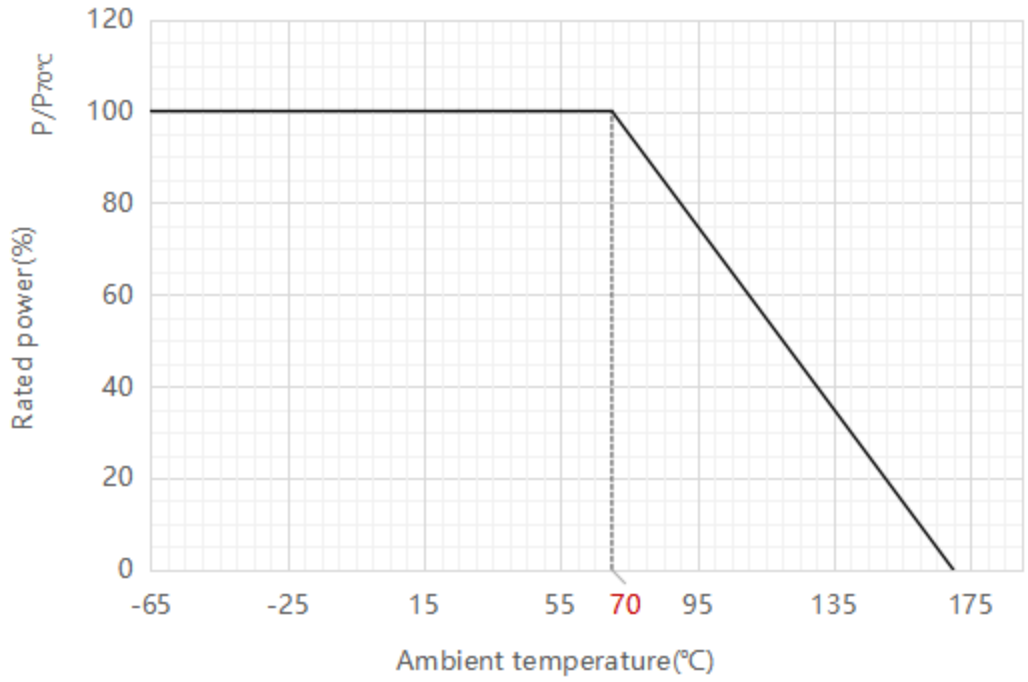
3. Endurance Test

Iterms	Additional Requirements	Reference	Limits
High Temperature Operational Life	The power supply should be applied to the component intermittently for 1000 hours:90 minutes ON and 30 minutes OFF,Temperature of the Chamber: maximum specified operating temperature at 100% rated power without derating	MIL-STD-202 Method 108	±0.5%
High Temperature Exposure	1000hrs.@T=170℃.Unpowered.	MIL-STD-202 Method 108	±0.5%
Humidity Bias	1000hrs 85℃/85%RH。 Note:Specified conditions:10% of operating power.	MIL-STD-202 Method 103	±0.5%
Temperature Cycling	1000 Cycles (-55°C to +150° C) be measured within 24± 4 hours aftertest. maximum dwell time 30min. at each temperature extreme. maximum transition time 1 min. .	JESD22-A104	±0.5%
Solderability	245℃±5℃,5s±0.5s	J-STD-002	95% Coverage Minimum
Short Time Overload	5×Rated power for 5 s	MIL-STD-202 Method 301	±0.5%
Resistance to Soldering Heat	260℃±5℃，10s±1s	MIL-STD-202 Method 210	±0.5%

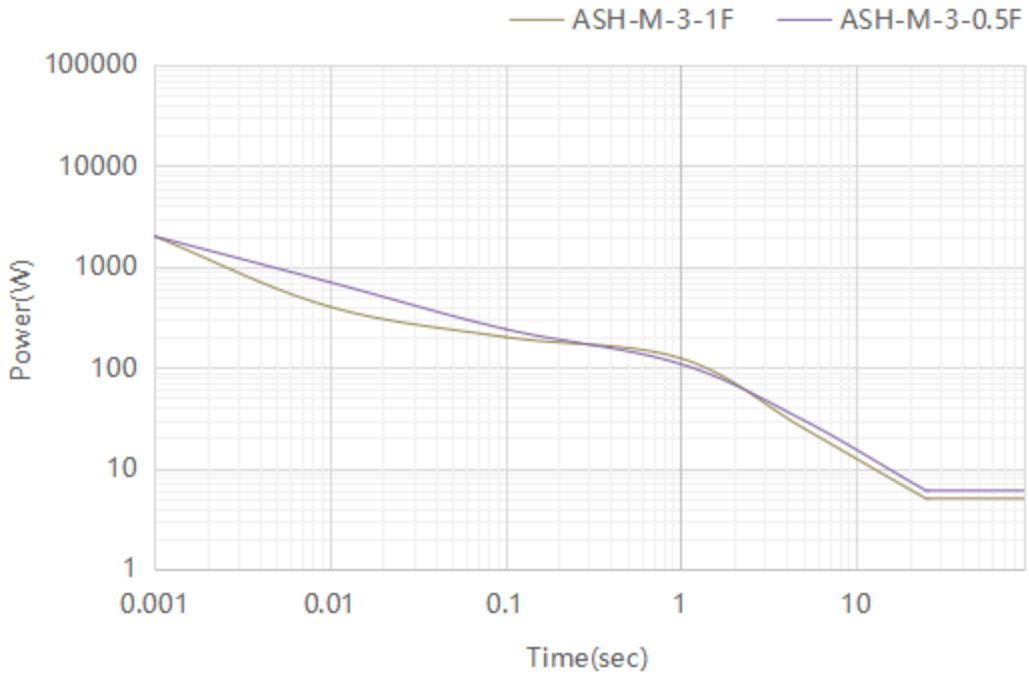
Mechanical Shock	1) Pulse waveform: Half-Sine pulse. 2) Accelerate peak: 100g. 3) Pulse duration: 6ms. 4) Orientation & Shock time: ±X, ±Y, ± Z; 3 times each orientation, total 18 times	MIL-STD-202H Method 213	±0.5%
Vibration	5 g's for 20 min, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	MIL-STD-202 Method 204	±0.5%
Terminal Strength	1) Press tool: A pointed thruster with a radius of 0.5 mm. 2) Shear force: 17.7N. 3) Duration: 60 (+1) seconds.	AEC-Q200-006 REV A	±0.5%
ESD	1) Direct Contact (DC): ±6kV; 2) Air Discharge (AD): ±12kV, ±16kV, ±25kV;	AEC-Q200-002 REV-B	±0.5%
Board Flex	1) PCB board size(H×W×T): 100mm × 40mm ×1.6mm. 2) Press tool: r = 340mm, Width = 20mm. 3) Deformation displacement: 2mm. 4) Duration: 60 (+5) s.	AEC-Q200-005 REV A	±0.5%
Flame Retardance	1) Test current: 100%, 115%, 130%, 150% (rated current). 2) Test duration: 1h. The following constitutes a failure: 1) A flame over 3.0 seconds duration; 2) An explosion;	AEC-Q200-001 REV B	>10s for 350℃

	3) A temperature above 350℃ sustained for over 10 seconds.		
Resistance to Solvents	1) Solvent a: 1 part (by volume) of isopropyl alcohol reagent grade and 3 parts (by volume) of a mixture of 80% (by volume) of kerosen e and 20% (by volume) ethylbenzene. 2) Solvent c: 9 parts (by volume) of D-limonene and 1 part of surfactant. 3) Solvent d: 42 parts (by volume) of water 1 part (by volume) of propylene glycol monome thyl ether 1 part (by volume) of monoethanol amine.	MIL-STD-202H Method 21 5	There was no mis sing, faded, smear ed, blurred, or shif ted (dislodged) wit h the marks. Ther e was no crack, se paration, crazing, swelling, softening , degradation on t he samples.

4.Power Derating Curve



5.Pulse power curve

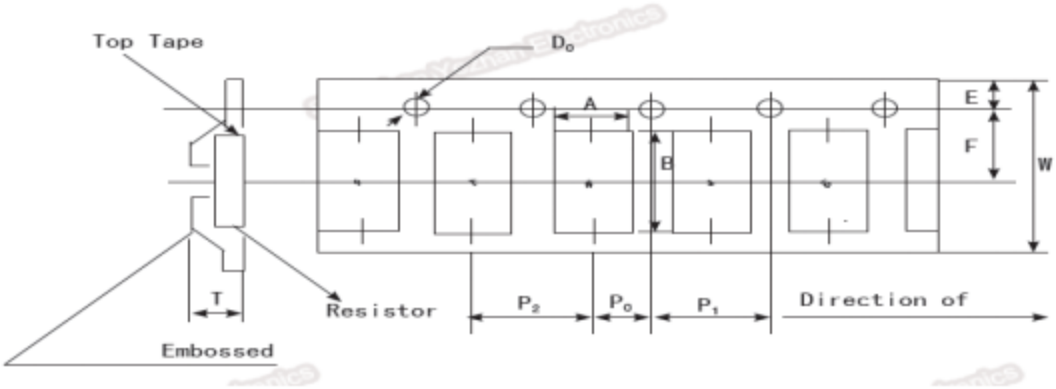


***Pusle power testing is based on ambient temperature 120°C.**

6.Marking

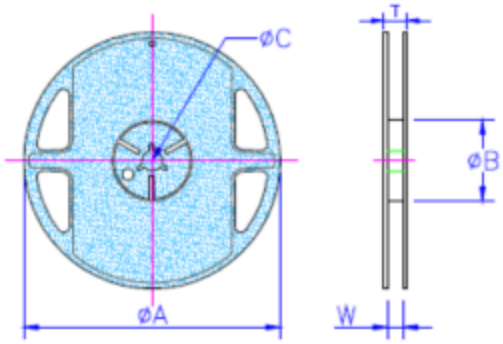
Type	Mark	Explanation
ASH-M-2512	R001 1%	Resistance: 1mΩ Tolerance: ±1%
	0m50 0.5%	Resistance: 0.5mΩ Tolerance: ±0.5%

7.Packing



Unit/mm

Size	A± 0.1	B± 0.1	W± 0.3	E± 0.11	F± 0.1	P0± 0.1	P1± 0.1	P2± 0.1	D0± 0.1	T± 0.2	Quantity (pcs)
2512-0.5	3.5	6.7	16	1.75	5.5	2	4	8	1.5	2.0	2000
2512-1										1.5	3000



Size	φA	φB	φC	W	T
2512	178	60	13	16.5	21

This document is a product specification. Contents are subject to change without notice.

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