APPROVAL SHEET

ASRL-3921 SERIES

Alloy Shunt Resistors

Version	Date	Description of amendment	Draft	Checked
A1.0	2025-08-13	First edition	范荣丰	邓小辉

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1.Product Description

Product name:ASRL series

Description:ASRL series Alloy Shunt Resistor 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,Dimension and resistance value.

Example: ASRL-M-3921-0.5F

Type	Resistance Alloy	Dimension (in)	Resistance Value	Tolerance
ASRL	M=CuMn K=Karma	3921	0.5 Unit：mΩ	D=±0.5% F=±1% J=±5%

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

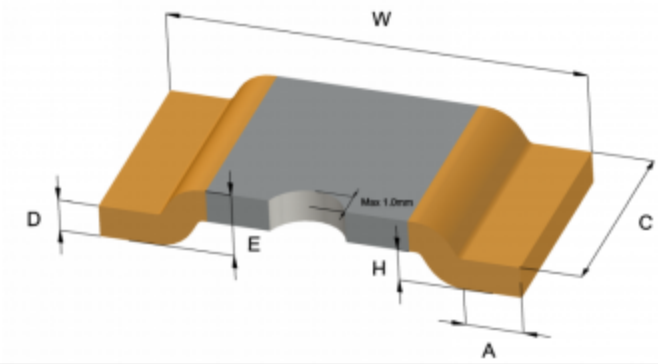
(2) **Resistance Alloy:**M=CuMn;K=Karma

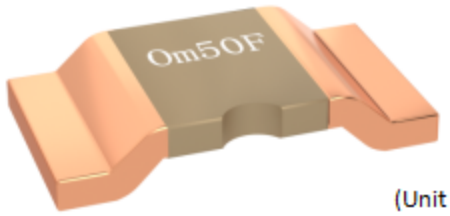
(3) **Dimension:**3921

(4) **Resistance:**0.5

(5) **Tolerance：** D=±0.5%;F=±1%;J=±5%

1.2 Products Dimension

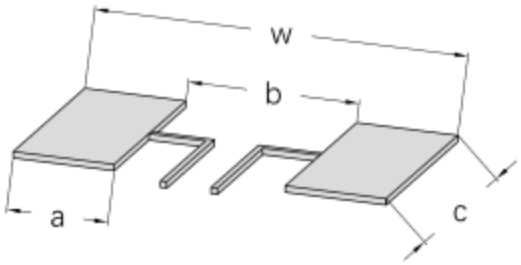




(Unit： mm)

Size (in)	Type	Value (mΩ)	W	C	E	A	H	D
3921	ASRL-M-3921-0.5	0.5	10(-0~+0.2)	5.3(-0~+0.25)	1.35± 0.15	2.0 ± 0.2	0.5 ± 0.1	0.85±0.1
	ASRL-M-3921-1	1.0	10(-0~+0.2)	5.3(-0~+0.25)	0.95± 0.15	2.0 ± 0.2	0.5 ± 0.1	0.45±0.1
	ASRL-K-3921-2	2.0	10(-0~+0.2)	5.3(-0~+0.25)	1.15± 0.15	2.0 ± 0.2	0.5 ± 0.1	0.65±0.1

1.3 PCB-layout (Reflow-soldering)



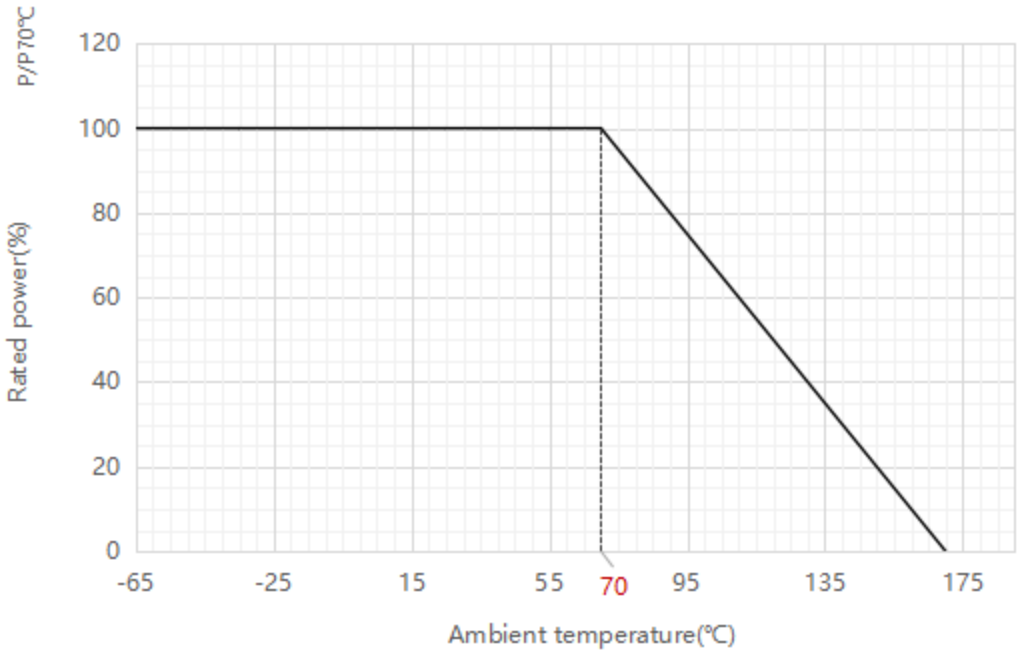
Solder pad type	w	c	a	b
ASRL-M-3921	11	6.2	2.7	5.6

2. Technical Data

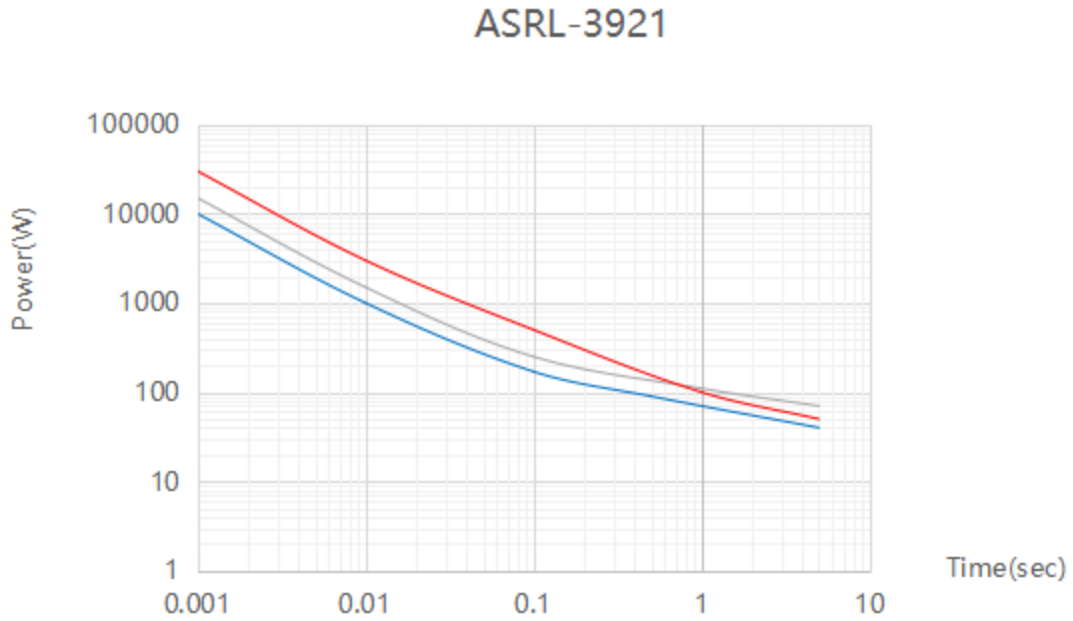
Size (in)	Type	value (mΩ)	Element material	*TCR (ppm/℃)	P70 ° C (W)
3921	ASRL-M-3921-0.5	0.5	CuMn	±70	9
	ASRL-M-3921-1	1.0	CuMn	±50	9
	ASRL-K-3921-2	2.0	Karma	±50	9

***TCR（ppm/℃）：Test was conducted with the temperature from 20℃ to 120℃ , while 20℃ worked as reference.**

3. Power Derating



4.Pulse power curve



5. Endurance Test

Iterms	Additional Requirements	Reference	Limits
Temperature Cycling	1000 Cycles(-55°C to +150°C)	JESD22 Method JA-104	±0.5%
High Temperature Exposure	1000 hrs. (T=170°C) , unpowered. Measurement at 24± 4 hoursafter test conclusion .	MIL-STD-202 Method 108	±0.5%

Biased Humidity	1000hrs. (85℃/85%RH) . Note: Specify conditions: 10% of rate power. Measurement at 24± 4 hoursafter test conclusion	MIL-STD-202Method 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 hoursafter test conclusion .	MIL-STD-202 Method 108	±0.5%
Solderability	Weld bath temperature 245°C±5°C,duration5±0.5S .	J-STD-002C	95% Coverage Minimum
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%
Resistance to Soldering Heat	250℃±5℃ , 30s±5s	MIL-STD-202 Method 210	±0.5%
Short Time Overload	Apply 5 times the rated power for 5 seconds and release the load for about 30 minutes, then measure its resistance variance rate.	MIL-STD-202 Method 301	±0.5%
Mechanical Shock	1) Pulse waveform: Half-Sine pulse. 2) Accelerate peak: 100g. 3) Pulse duration: 6ms. 4) Orientation & Shocktime: ±X, ±Y, ±Z; 3 times each orientation, total 18 times	MIL-STD-202H Method 213	±0.5%

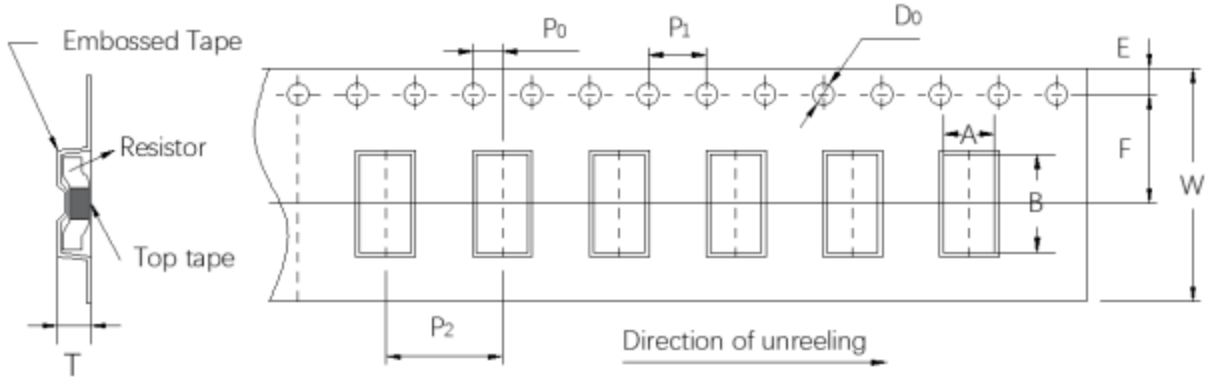
ESD	1) Direct Contact (DC): ±6kV; 2) Air Discharge (AD): ±12kV, ±16kV, ± 25kV;	AEC-Q200-002 REV-B	±0.5%
Board Flex Test	1) PCB board size(H×W×T): 100mm ×40mm ×1.6mm. 2) Press tool: r = 340mm, Width = 20mm. 3) Deformation displacement: 2mm. 4) Duration: 60 (+5) s.	AEC-Q200-005 REV A	±0.5%
Flame Retardance	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; 3) A temperature above 350℃ sustained for over 10 seconds.	AEC-Q200-001 REV B	>10s for 350℃

6.Marking

Mark	Explanation
R001 F	R001：1mΩ (Value 阻值) F：±1% (Tolerance 精度)
0m50 F	0m50：0.5mΩ (Value 阻值) F ：±1% (Tolerance 精度)

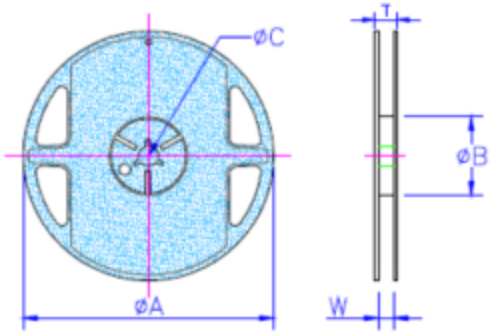
7.Packing

Embossed plastic Tape Specifications



Unit/mm

Size-Resistance	A± 0.2	B± 0.2	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)
3921-0.5	5.7	10.4	16	1.75	7.5	2	4	12	1.5	1.6	2500
3921-1	5.7	10.4	16	1.75	7.5	2	4	12	1.5	1.4	2500
3921-2	5.7	10.4	16.2	1.75	7.5	2	4	12	1.5	1.4	2500



Size (in)	φA	φB	φC	W	T
3921	330	100	13	24.5	29

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

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