ARCS6918-L050

Shunt Resistor

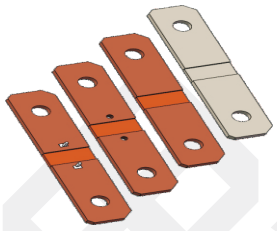
Precision manganin copper alloy shunt, ±0.5% accuracy class
All welded construction, low thermal EMF and PCR, AEC-Q200 compliant

Introduction

The ARCS series which targets automotive market can cover from hundreds to thousands of amperes. Due to special alloy materials, the ARCS series has good long-term stability and is capable to withstand pulse current several times, which is higher than the rated current.

Shunt resistance value and surface temperature will keep changing when loaded. The factors that cause the change in resistance include TCR and dimensional change caused by thermal expansion, etc. Shunt resistance tends to be stable when self- heating and heat dissipation reach dynamic balance, but high current coefficient will cause the change of shunt resistance greater than nominal tolerance. The special heat treatment process of the ARCS series make it a low current coefficient with very good compensation characteristics.

Because there is always a distance between the voltage sampling point and the resistor heating center, temperature difference is appeared, so a lower thermal EMF is particularly important. The ARCS series has thermal EMF of less than 0.5μV/°C to copper, and has little effect on the voltage output of the millivolt level. The flat structure of the ARCS series makes the inductance less than 3nH, which also performs perfect at high frequency applications.



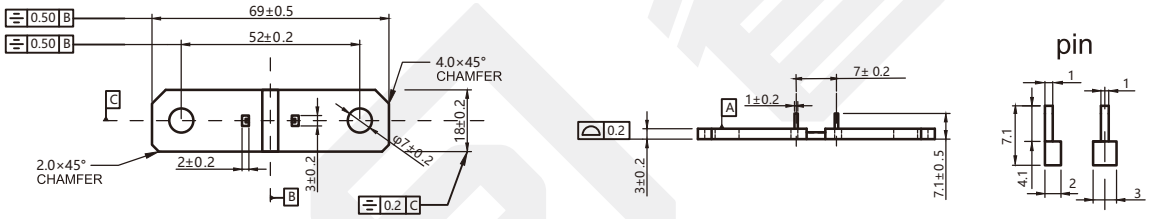
AEC-Q200 compliant 3D Model

Application

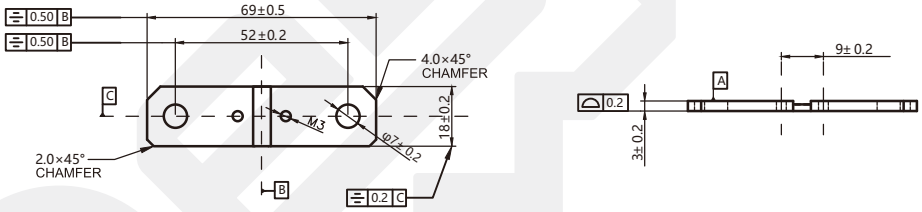
- Battery Management System
- Current Sensing
- Frequency Converter
- UPS
- Motor Control
- Electronic Load Equipment

Dimensions (mm)

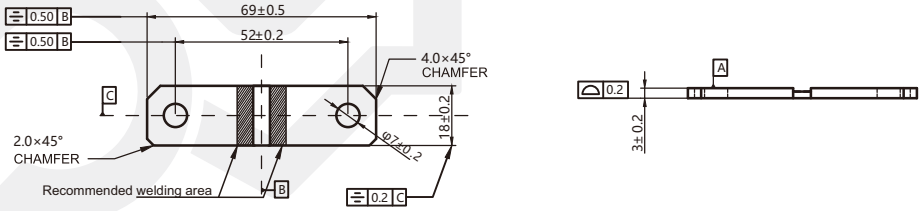
PIN



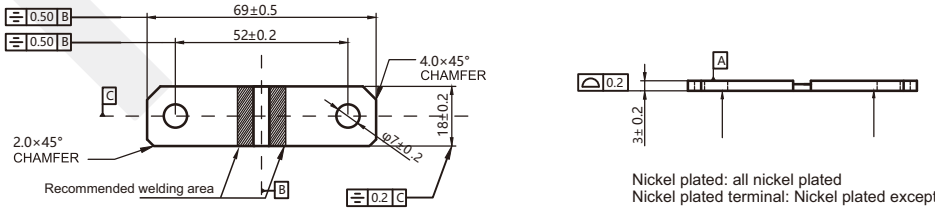
M3



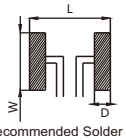
Standard



Standard
Nickel Plated



Nickel plated: all nickel plated
Nickel plated terminal: Nickel plated except alloy area



Recommended Solder Pad

L	D	W
12.8	4	19

Specifications

Model	Tolerance	Resistance	TCR (+20°C Ref)	Rated Current	Current Coefficient*	Rated Power	Structure	Weight
ARCS6918DL050A9	±0.5%	50μΩ	±150ppm/°C (+20℃~+175°C) ±200ppm/°C (-55℃~+20°C)	700A	<10ppm/A	25W	PIN	35g
ARCS6918FL050A9	±1%							
ARCS6918GL050A9	±2%							
ARCS6918JL050A9	±5%							
ARCS6918DL050B9	±0.5%		±150ppm/°C (+20℃~+175°C) ±200ppm/°C (-55℃~+20°C)				M3	
ARCS6918FL050B9	±1%							
ARCS6918GL050B9	±2%							
ARCS6918JL050B9	±5%							
ARCS6918DL050S9	±0.5%		±100ppm/°C (+20℃~+175°C) ±150ppm/°C (-55℃~+20°C)				Standard	
ARCS6918FL050S9	±1%							
ARCS6918GL050S9	±2%							
ARCS6918JL050S9	±5%							
ARCS6918DL050SN	±0.5%		±150ppm/°C (+20℃~+175°C) ±200ppm/°C (-55℃~+20°C)				Standard Nickel plated*	
ARCS6918FL050SN	±1%							
ARCS6918GL050SN	±2%							
ARCS6918JL050SN	±5%							
ARCS6918DL050S4	±0.5%		±100ppm/°C (+20℃~+175°C) ±150ppm/°C (-55℃~+20°C)				Nickel plated terminal*	
ARCS6918FL050S4	±1%							
ARCS6918GL050S4	±2%							
ARCS6918JL050S4	±5%							

*$(R_1-R_2)/[(I_1-I_2)*R_0]$($R_1$: 2/3 times rated current, 10 min; R_2: 1/10 times rated current, 10 min; R_0: Initial resistance; I_1: 2/3 times rated current; I_2: 1/10 times rated current.)
*Full nickel plating is the whole nickel plating, including the resistive alloy part, can completely prevent resistive alloy part from the oxidation,but the TCR performance is slightly reduced; half nickel plating type is partial nickel plating, the resistive alloy part is not nickel plated but only the copper terminal.

Performance

Test	Test method	Test limits
Thermal Shock	-55°C/+155°C,1000cycles,15minutes each	△ R≤±0.5%
Short-Time Overload	5 times rated power, 5 seconds	△ R≤±0.5%
Low Temp.Storage	-55°C for 24 hours	△ R≤±0.5%
High Temp.Exposure	+170°C for 1000 hours	△ R≤±1.0%
Humidity Resistance	+85°C, 85% RH 0.1 times rated power, 1000 hours	△ R≤±0.5%
Moisture Resistance	100G 6mS, 5 times	△ R≤±0.5%
Vibration	Frequency varied 10Hz to 2000Hz in 1minute, X-Y-Z direction, 12 hours	△ R≤±0.5%
Load Life Stability	Rated power, +70°C, 1.5 hours on, 0.5 hours off, 1000 hours	△ R≤±1.0%

Part Number Information

Example: ARCS6918FL050A9 (ARCS 6918 ±1% 50μΩ PIN)

A	R	C	S	6	9	1	8	F	L	0	5	0	A	9

- Series: ARCS
- Size: 6918
- Tolerance: D=±0.5% F=±1% G=±2% J=±5%
- Resistance: L050=50μΩ
- Structure: A=PIN B=M3hole S=Standard
- Packaging: 9=Standard 0-8=Custom N= Nickel plated 4=Nickel plated terminal

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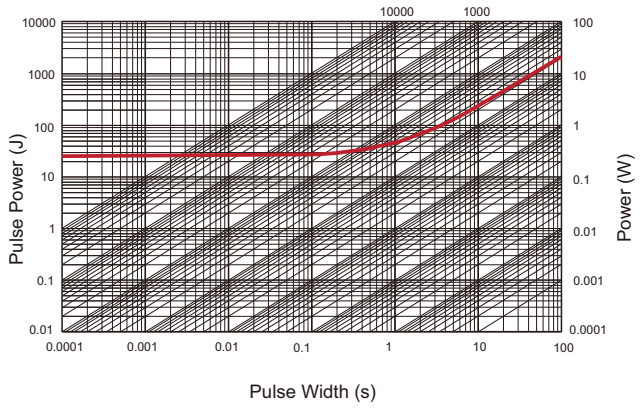
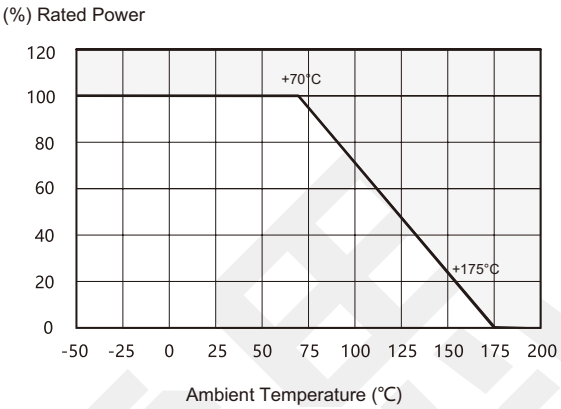
Shunt Resistor

Pulse Power



Derating Curve



Safe Storage

(1) The shunt should be stored at a temperature of +5 to +35°C, humidity <60% RH, and the humidity should be kept as low as possible.
(2) The shunt should be protected from direct sunlight.
(3) The shunt should be stored in a clean, dry and free of harmful gases environment (hydrogen chloride, sulfuric acid, hydrogen sulfide).
(4) Wear gloves for installation and storage, to reduce the risk of surface oxidation.
(5) The shunt can be stored for at least 1 year in original package by following above instructions.

Installation Suggestions

It is recommended that the installation torque is not more than 10N·m.