

### Precision manganin copper alloy shunt, $\pm 0.5\%$ 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.

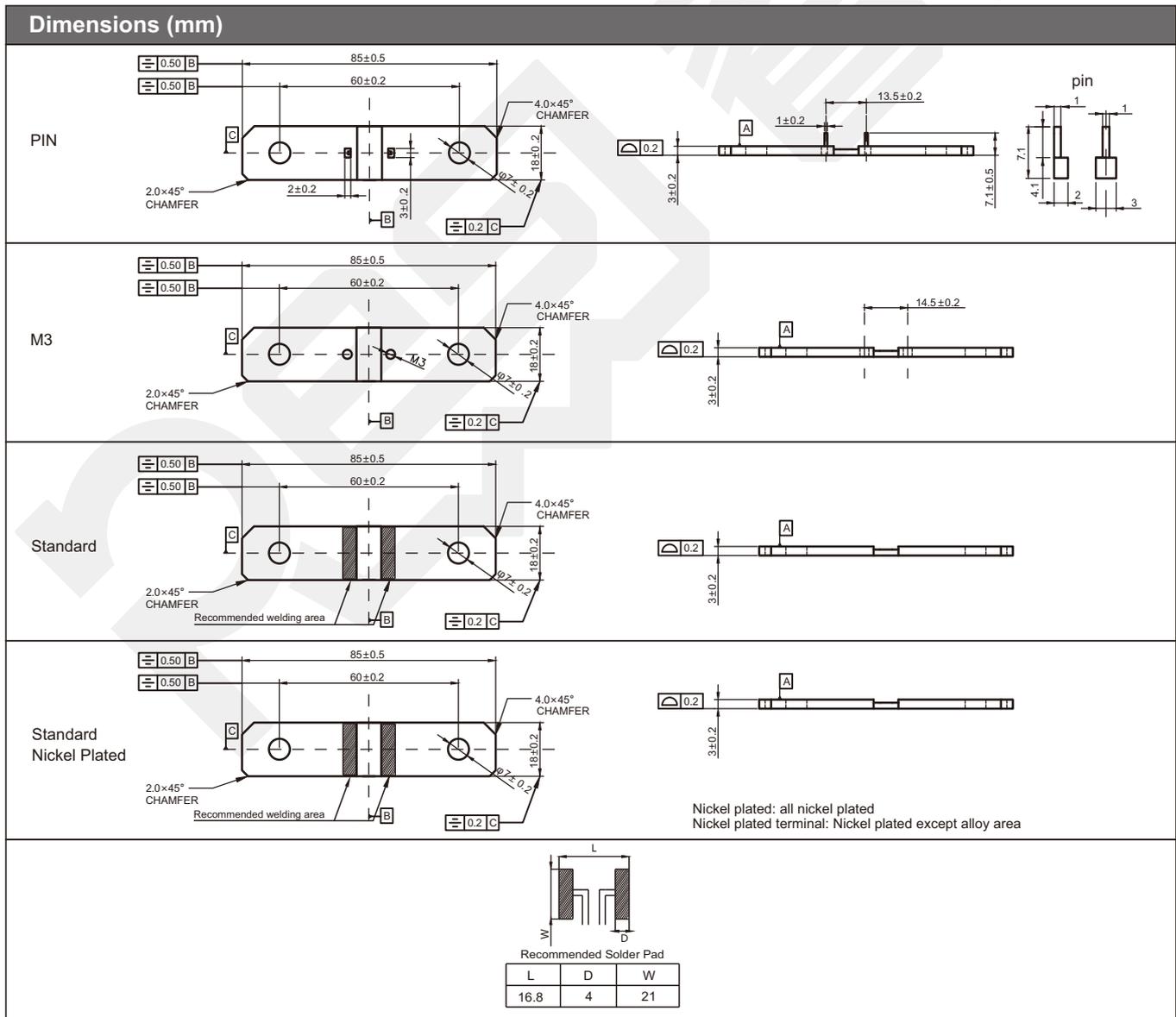
Because there is always a distance between the voltage sampling point and the resistor heating center, temperature difference is appeared, so a lower thermal EMF is particularly important. The ARCS series has thermal EMF of less than  $0.5\mu V/^\circ C$  to copper, and has little effect on the voltage 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

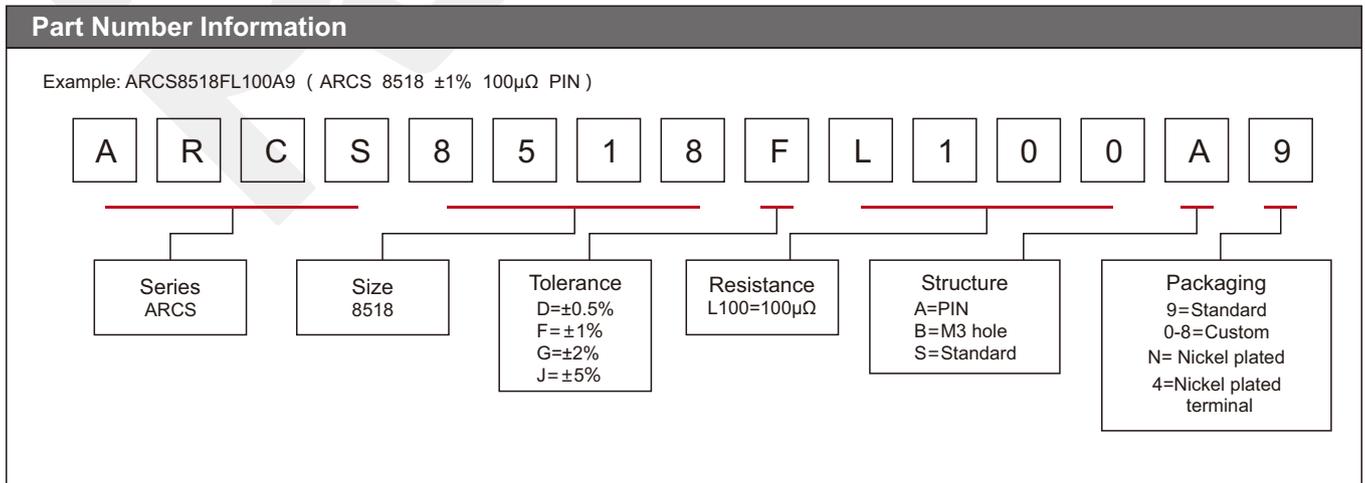


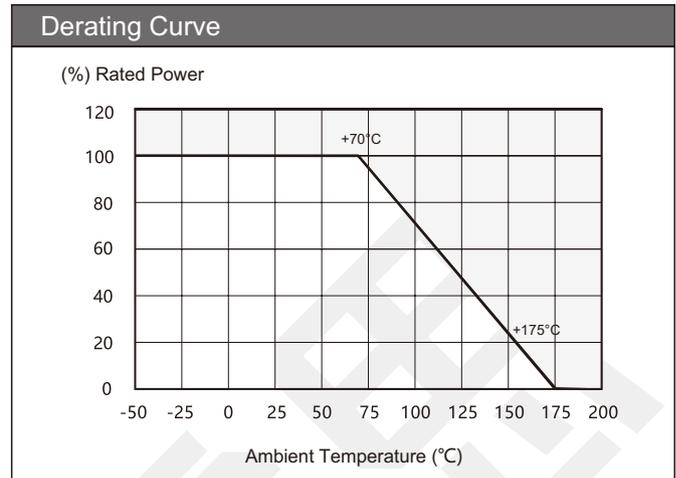
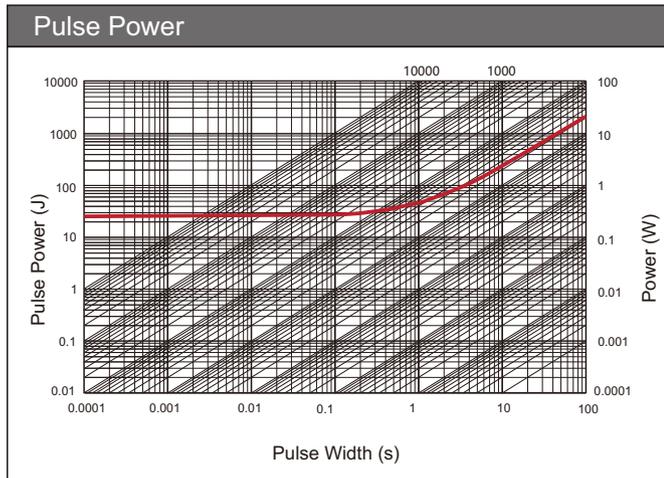
## Shunt Resistor

Specifications								
Model	Tolerance	Resistance	TCR (+20°C Ref)	Rated Current	Current Coefficient*	Rated Power	Structure	Weight
ARCS8518DL100A9	±0.5%	100μΩ	±100ppm/°C (+20°C~+175°C)	600A	<7ppm/A	36W	PIN	40g
ARCS8518FL100A9	±1%							
ARCS8518GL100A9	±2%		±150ppm/°C (-55°C~+20°C)					
ARCS8518JL100A9	±5%							
ARCS8518DL100B9	±0.5%		±100ppm/°C (+20°C~+175°C)					
ARCS8518FL100B9	±1%							
ARCS8518GL100B9	±2%		±150ppm/°C (-55°C~+20°C)					
ARCS8518JL100B9	±5%							
ARCS8518DL100S9	±0.5%		±50ppm/°C (+20°C~+175°C)					
ARCS8518FL100S9	±1%							
ARCS8518GL100S9	±2%		±100ppm/°C (-55°C~+20°C)					
ARCS8518JL100S9	±5%							
ARCS8518DL100SN	±0.5%		±100ppm/°C (+20°C~+175°C)					
ARCS8518FL100SN	±1%							
ARCS8518GL100SN	±2%		±150ppm/°C (-55°C~+20°C)					
ARCS8518JL100SN	±5%							
ARCS8518DL100S4	±0.5%	±100ppm/°C (+20°C~+175°C)						
ARCS8518FL100S4	±1%							
ARCS8518GL100S4	±2%	±150ppm/°C (-55°C~+20°C)						
ARCS8518JL100S4	±5%							

\*( $R_1 - R_2$ )/[( $I_1 - I_2$ )\* $R_1$ ]( $R_1$ : 2/3 times rated current, 10 min;  $R_2$ : 1/10 times rated current, 10 min;  $R_3$ : 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%





### 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.