

# AZ983

## 80 AMP AUTOMOTIVE RELAY

### FEATURES

- 80 Amps contact rating
- High momentary carry current
- High operating temperature range
- 1 Form A, 1 Form B and 1 Form C contact arrangements
- Optional built-in coil suppression circuit
- PCB solder terminals
- Epoxy sealed versions available



### CONTACTS

<b>Arrangement</b>	SPST-NO (1 Form A) SPST-NC (1 Form B) SPDT (1 Form C)
<b>Ratings (max.)</b>	(resistive load)
1 Form A switched power switched current switched voltage	1120 W 80 A 28 VDC
1 Form B, 1 Form C switched power switched current switched voltage	840 W 60 A 28 VDC
<b>Rated loads</b>	
1 Form A	80 A at 14 VDC, resistive, 20°C 40 A at 14 VDC, resistive, 85°C 40 A at 28 VDC, resistive, 20°C 20 A at 28 VDC, resistive, 85°C 120A inrush at 28 VDC, resistive, 85°C (inrush for ≤ 3 s with make/break ratio 1:10)
1 Form B	60A at 14 VDC, resistive, 20°C 30A at 14 VDC, resistive, 85°C 30A at 28 VDC, resistive, 20°C 15A at 28 VDC, resistive, 85°C
1 Form C	60 A (NO) / 60A (NC) at 14 VDC, resistive, 20°C 40 A (NO) / 30A (NC) at 14 VDC, resistive, 85°C 40 A (NO) / 30A (NC) at 28 VDC, resistive, 20°C 20 A (NO) / 15A (NC) at 28 VDC, resistive, 85°C
<b>Contact material</b>	AgSnO <sub>2</sub> (silver tin oxide)
<b>Contact resistance</b>	≤ 50 mΩ initial (at 24V/1 A, voltage drop method)

### COIL

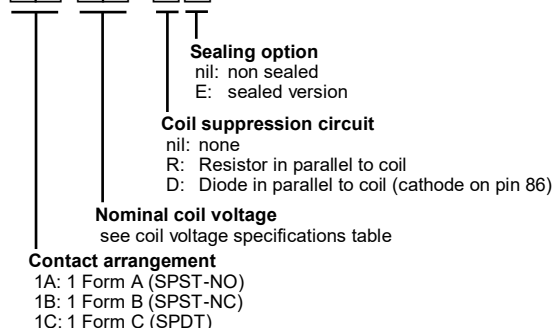
<b>Nominal coil voltages</b>	6, 12, 24 (DC)
<b>Dropout voltage</b>	≥ 10% of nominal coil voltage
<b>Coil power nominal</b>	(at 23°C) 1.8 W
<b>Temperature rise</b>	68 K at nom. coil voltage
<b>Insulation system</b>	class F, max. temperature 155°C

### GENERAL DATA

<b>Life Expectancy</b>	(minimum operations)
mechanical	1 x 10 <sup>7</sup>
electrical	1 x 10 <sup>5</sup> at rated current, 14VDC, resistive
<b>Operate Time</b>	7 ms (typ., at nominal coil voltage)
<b>Release Time</b>	5 ms (typ., nom. coil voltage, w/o suppression)
<b>Dielectric Strength</b>	(at sea level for 1 min.)
coil to contact	500 V <sub>RMS</sub>
open load contact	500 V <sub>RMS</sub>
<b>Insulation Resistance</b>	≥ 100 MΩ (at 23°C, 500 VDC, 50% RH)
<b>Temperature Range</b>	(at nominal coil voltage)
operating	-40°C to 85°C
<b>Vibration Resistance</b>	1.5 mm DA at 10–55 Hz
<b>Shock</b>	10 g
<b>Enclosure material</b>	Polyamide
<b>Terminals</b>	Tinned copper alloy, THT PCB mounting
<b>Soldering</b>	(referring IEC 61760-1 wave soldering)
preheating	120°C (248°F) / ≤ 120 s
soldering	260 ±5°C (500 ±9°F) / ≤ 2 x 5 s
<b>Dimensions and Weight</b>	29.0 mm x 29.0 mm x 28.0 mm, 40 grams
<b>Packing (pcs.)</b>	20 per plastic tray 400 per carton box

### ORDERING DATA

AZ983-□□-□□D□□



### Example ordering data

AZ983-1A-12D 1 Form A contact arrangement, 12VDC nominal coil voltage, no suppression circuit, non-sealed

AZ983-1C-24DDE 1 Form C contact arrangement, 24VDC nominal coil voltage, diode in parallel to coil, sealed

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## COIL VOLTAGE SPECIFICATIONS

Voltage [VDC]			Resistance [ $\Omega$ ] $\pm 10\%$	Power (ref.) [W]	Parallel resistor (option R) [ $\Omega$ ]
nominal	must operate	max.			
6	3.9	7.8	20	1.8	180
12	7.8	15.6	80		680
24	15.6	31.2	320		2700

### Notes:

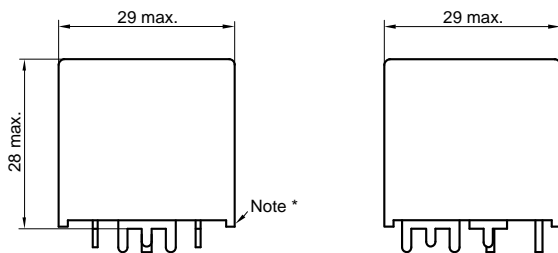
- All values at 23°C, upright position, terminals downward.
- Voltage max. is the voltage the coil can endure for a short period of time.

## MECHANICAL DATA

Dimensions in mm. Tolerance  $\pm 0.3\text{mm}$  if not stated otherwise.

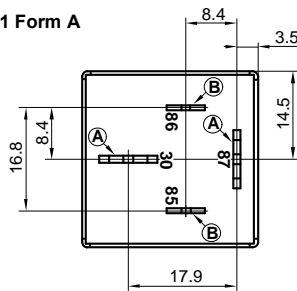
### Notes:

- Drawings based on 1 Form C sealed version unless otherwise stated.
- Terminal 87a is omitted at 1 Form A versions.
- Terminal 87 is omitted at 1 Form B versions.
- Pin dimensions for reference only and given without tin coating.
- \* Tabs only at sealed versions.

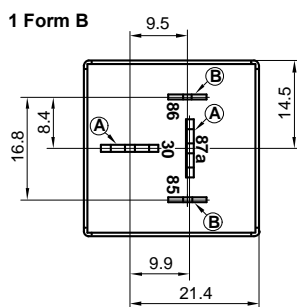


Bottom view

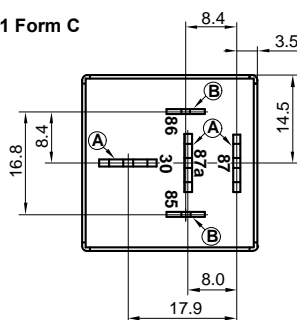
1 Form A



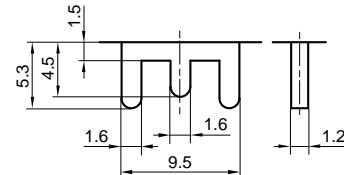
1 Form B



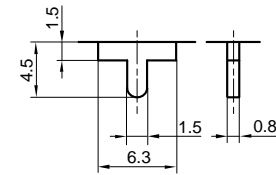
1 Form C



Detail A



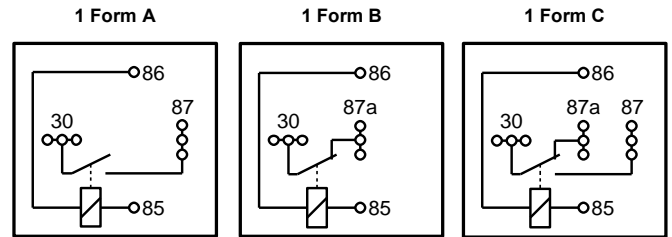
Detail B



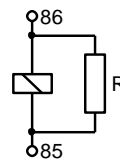
CAD data in attachment of this datasheet.

## WIRING DIAGRAMS

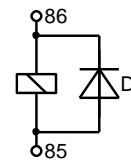
Viewed towards terminals.



Option R



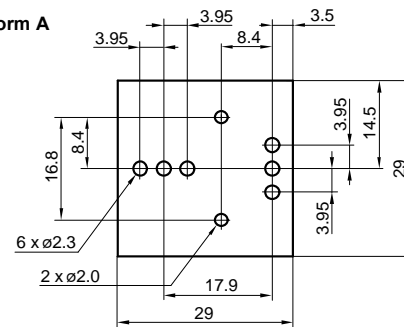
Option D



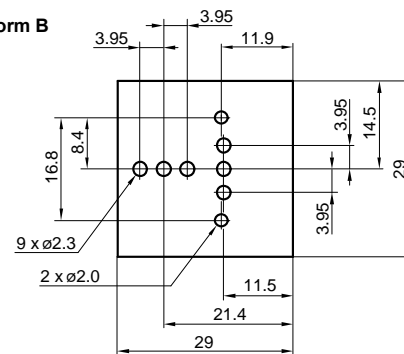
## PCB FOOTPRINT

Layout and footprint recommendation. Dimensions in mm. Viewed towards terminals.

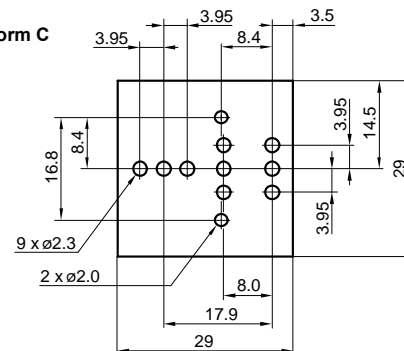
1 Form A



1 Form B



1 Form C



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## NOTES

### General

1. All values in this datasheet are at reference temperature of 23°C (73°F) unless stated otherwise.
2. Evaluate the component's performance and operating conditions under the worst-case conditions of the actual application.
3. The datasheet and the component's specifications are subject to change without notice.

### Storage, handling, and environmental guidelines

4. Relays are electromechanical components that are sensitive to shock. The relay's adjustment can be affected if the relay is subjected to excessive shock or excessive pressure is applied to the relay case. Relays which have been dropped must no longer be used.
5. Substances containing silicone or phosphorus must be avoided in the vicinity to the relay. Outgassing from these substances can penetrate the relay and adhere on the contacts. Deposits of these substances may act as insulators and adversely affect the contact resistance. Silicone can be found e.g. in gaskets, lubricants or filling materials, phosphorus can be found e.g. as a flame retardant in plastics.
6. Prevent relays from atmospheres containing corrosive gases. Corrosion of internal structures and contacts leads to malfunction and shortens the component's service life.
7. Prevent non-sealed relays from atmospheres subject to dust. Dust particles may enter the case and get stuck between the contacts, causing the contact circuits to fail.
8. Do not use these relays in environments with explosive or flammable gases. Electrical arcing at the contacts could ignite these gases and cause fire.
9. For automated dual wave soldering process we recommend preheating with 120°C (248°F) for max. 120 seconds and a soldering temperature of 260 ±5°C (500 ±9°F) for max. 10 seconds soldering time (max. 5 seconds per wave). For manual soldering we recommend 350°C (662°F) max. temperature for max. 5 seconds. During the soldering process, no force may be exerted on the relay terminals.
10. Non-sealed relays must not be washed, immersion cleaned or conformal coated as substances may enter the case and cause corrosion or seizure of mechanical parts.
11. Avoid high frequency or ultrasonic vibrations on the relays as these can cause contact welding and misalignment or destruction of internal structures.
12. During operation, storage and transport, ambient temperature should be within the specified operating temperature range. Humidity should be in the range of 5% to 85% RH. Icing and condensation must be avoided. Relays stored for an extended period of time may show initially increased contact resistance values due to chemical effects such as oxidation.

### Design guidelines

13. The relay may pull in and operate with less than the specified *must operate* voltage value.
14. The coil's *must operate*, the coil's *ohmic resistance* and the relay's *operate time* depend on the temperature of the coil. The specified values are given for a coil temperature of 23°C and increase by approx. 0.39% per Kelvin of temperature rise. This circumstance must be considered, especially during operation with high load currents and elevated ambient temperature.
15. Coil suppression circuits such as diodes, etc. in parallel to the coil will lengthen the release time. We recommend using suppression circuits with a breakdown voltage of approx. 2 times the nominal coil voltage in order to achieve a quick release time.
16. Contact resistance is a function of load current, dwell time and wear level of the contacts. Immediately after closing the contacts, or if tested with low current only, the contact resistance will show a relatively high value. A low level steady state contact resistance is reached at higher current after a certain time in thermal equilibrium.
17. The relay dissipates heat from power losses through its load terminals. Provide sufficient cross section and area of the PCB traces so that they can act as heat spreader.
18. For PCBs with multiple relays, do not place the components directly next to each other. We suggest providing a mounting distance of minimum 10 mm to allow for better cooling.

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## DISCLAIMER

This product specification is to be used in conjunction with the application notes which can be downloaded from the regional ZETTLER relay websites. The specification provides an overview of the most significant part features. Any individual applications and operating conditions are not taken into consideration. It is recommended to test the product under application conditions. Responsibility for the application remains with the customer. Proper operation and service life cannot be guaranteed if the part is operated outside the specified limits.

## ZETTLER GROUP

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