AZ21503

MINIATURE 40/50 AMP POWER RELAY

FEATURES

- Up to 50 Amp switching capability
- High dielectric strength of up to 4000 VAC
- Epoxy sealed versions available
- Small dimensions and footprint
- Cost efficient high power relay
- Low coil power consumption
- Class F (155°C) insulation system
- Approved ratings acc. IEC 61810-1 and IEC 60730-1

RoHS

CONTACTS

Arrangement	SPST (1 Form A)
Ratings (max.) switched voltage 40 Amps version switched current switched power 50 Amps version switched current switched power	(resistive load) 277 VAC 40 A 11080 VA 50 A 13850 VA
Rated Loads 40 Amps version 50 Amps version	(acc. IEC 61810-1, IEC60730-1 at TÜV) 40 A at 277 VAC, 50k cycles, 85°C, resistive 50 A at 277 VAC, 20k cycles, 60°C, resistive 50 A at 277 VAC, 6k cycles, 85°C, resistive Note: Approvals only with the vent hole open for RT III (wash tight) types.
Contact materials	$AgSnO_2$ (silver tin oxide)
Contact gap	≥ 0.8 mm
Initial resistance max. typ.	 50 mΩ (1A / 24V, voltage drop method) 1 mΩ (50A / 6V, voltage drop method)

COIL

Nominal coil DC voltages	12, 24
Dropout voltage	> 10% of nominal coil voltage
Coil power at nominal voltage at pickup voltage	(typ. at 23°C) 900 mW 500 mW
Temperature Rise	typ. 42 K (76°F) at nominal coil voltage
Max. temperature	155°C (311°F), class F insulation system

GENERAL DATA

Life Expectancy mechanical electrical	(minimum operations) 1 x 10^6 see section *Rated Loads*
Timing operate time release time	(max. / typ.) 15 ms / ≤ 10ms (at nominal coil voltage) 10 ms / ≤ 5 ms (without coil suppression)
Dielectric Strength coil to contact between open contacts	(at sea level for 1 min.) 2500 VAC 4000 VAC (with high dielectric strength option) 1500 VAC
Insulation Distances coil to contact 2500 VAC version 4000 VAC version open load contacts	(clearance / creepage) ≥ 1.9 mm / ≥ 4.3 mm ≥ 4.3 mm / ≥ 4.3 mm ≥ 0.8 mm / ≥ 8.3 mm
Insulation Resistance	1000 MΩ (min.) at 20°C, 500 VDC, 50% RH
Rated Insulation Type	Basic insulation, OVC II, PD2
Temperature Range operating	 -40°C (-40°F) to 85°C (185°F)
Vibration	0.062" (1.5 mm) DA at 10–55 Hz
Shock	20 g
Enclosure protection category material group flammability	PBT polyester flux proof (RTII) / wash tight (RTIII) IIIa UL94 V-0
Terminals	Tinned copper alloy, THT PCB mounting
Soldering preheating soldering	(referring IEC 61760-1 wave soldering) 120°C (248°F) / ≤ 120 s 260 ±5°C (500 ±9°F) / ≤ 2 x 5 s
Cleaning max. solvent temp. max. immersion time	(RTIII wash tight types only) 80°C (176°F) 30 seconds
Dimensions	32.2 mm x 27.2 mm x 19.3 mm
Weight	26 grams (approx.)
Compliance	IEC 61810-1, UL 508, RoHS, REACH
Agency Approvals TÜV	 R 50692888
Packing (pcs.)	40 per plastic tray 280 per carton box

AZ21503

COIL VOLTAGE SPECIFICATIONS

Voltage [VDC]			Resistance [Ω] ±10%
nominal	must operate	maximum	
12	9.0	15.6	155
24	18.0	31.2	660

Notes:
1) All values at 23°C, upright position, terminals downward.
2) Voltage maximum is the voltage the coil can endure for a short period of time.

ORDERING DATA

AZ21503-1AE□-□□D□F□

Dielectric strength option
nil: 2500 VAC
T: 4000 VAC

Sealing option
nil: flux tight - non sealed
E: wash tight - sealed version

Nominal coil voltage
see coil voltage specifications table

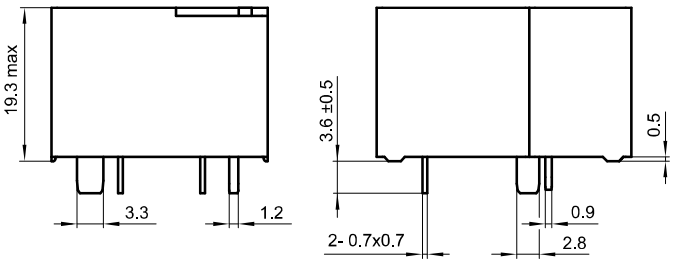
High capacity option
nil: 40 Amps switching capacity
T: 50 Amps switching capacity

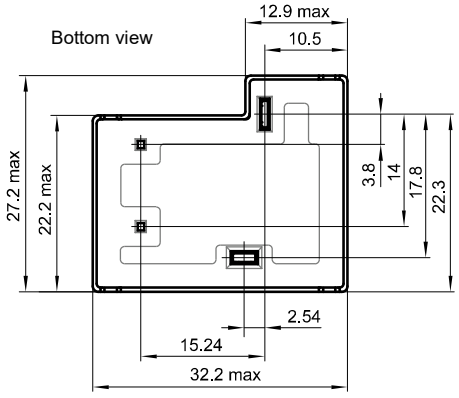
Example ordering data

AZ21503-1AE-12DF	40 Amps capacity, 12 VDC coil voltage, flux tight
AZ21503-1AET-12DF	50 Amps capacity, 12 VDC coil voltage, flux tight
AZ21503-1AET-24DEFT	50 Amps capacity, 24 VDC coil voltage, wash tight version with high dielectric strength option

MECHANICAL DATA

Dimensions in mm. Tolerance ±0.3mm if not stated otherwise.
Note: Pin outline dimensions for reference only and given without tin coating.

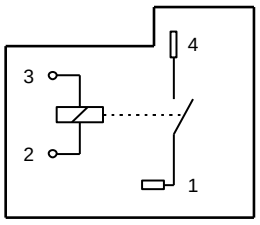




CAD data in attachment of the datasheet.

WIRING DIAGRAM

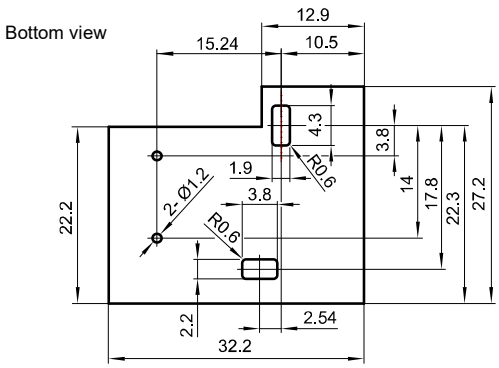
Viewed towards terminals



Pins	Description
1, 4	Load contact
2, 3	Coil

PCB FOOTPRINT

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



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. Protect relays from atmospheres containing corrosive gases, liquids, or solids such as water vapor, H2S, SO2, NO2, Cl, P, dust, and other harmful substances and elements. Corrosion of internal structures and contacts leads to malfunction and shortens the component's service life.
7. Prevent non-sealed relays and relays with opened vent hole 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. With sealed versions of this relay type, the vent hole must be cut open after washing or conformal coating to achieve the specified performance and service life. Care must be taken to ensure no particles get into the relay as a result of the cutting process.
12. Avoid high frequency or ultrasonic vibrations on the relays as these can cause contact welding and misalignment or destruction of internal structures.
13. 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

14. The relay may pull in and operate with less than the specified *must operate* voltage value.
15. The coil's *must operate* voltage, 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.
16. 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.
17. 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.
18. The relay dissipates heat form power losses through its load terminals. Provide sufficient cross section and area of the PCB traces so that they can act as heat spreader.
19. 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.

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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