

MHV Series Reed Relays

- **Features:** Smallest High Voltage SMD Relay, 1 kVDC switching, High Isolation Voltage, Low Leakage Currents, Effective Power Consumption
- **Breakdown Voltage** 3 kVDC and Dielectric Strength Coil/Contact 5kVDC
- **Off-State Leakage Current** in Nanoampere Range
- **No internal solder joints**, Reflow Soldering compatible
- **Creepage and Clearance** acc. to IEC 60664-1, ISO 6469-3, IEC 62109-1/2, IEC 60601-1
- **Tested acc. to AEC-Q200**, UL recognized, complied with RoHS and REACH
- **Applications:** Automotive, Electric Vehicles, Battery Management Systems, Photovoltaic Inverters, Isolation Measurement, Automated Test Equipment, Medical


Part Description: **MHV05-1A**

Nominal Voltage	Contact Quantity & Contact Form
05	1A

Customer Options	Switch Model	Unit
Contact Data (@ 20°C)	35/1	
Rated Power (max.) Any DC combination of V&A must not to exceed max. rated power	10	W
Switching Voltage (max.) DC or peak AC	1000	V
Switching Current (max.) DC or peak AC	0.7	A
Carry Current (max.) DC or peak AC	1.25	A
Contact Resistance (max.) @ 0.5V & 10mA, Measured with 40% Pull-In Overdrive	150	mOhm
Breakdown Voltage (min.) According to EN60255-27	3	kVDC
Off-State Leakage Current (typ.) @ 3000 V	3	nA
Operating Time (max.) Including Bouncing, Measured with 40% Pull-In Overdrive	0.8	ms
Release Time (max.) Measured without Coil Suppression	0.4	ms
Insulation Resistance (min.) Rh<45%, 100V Test Voltage	10 ¹¹	Ohm
Capacitance (typ.) @ 10kHz across open Switch	0.3	pF

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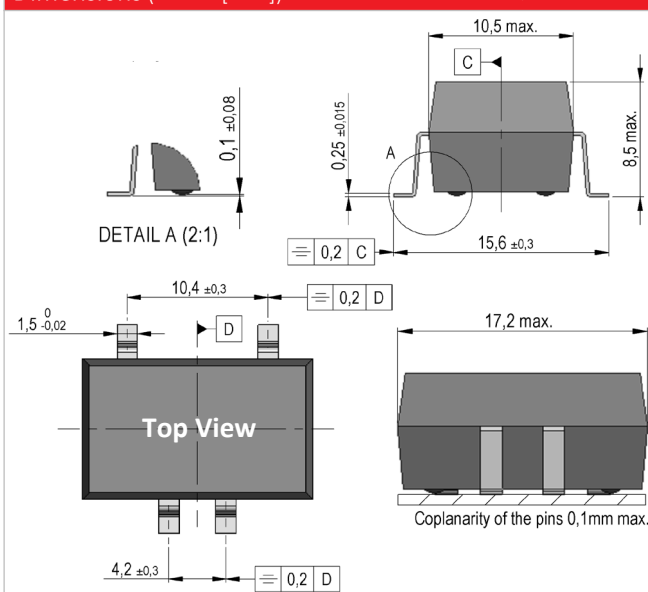
Coil Data (at 20°C)		Coil Voltage (VDC)		Coil Resistance (Ohm)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Coil Power (mW)	Coil Inductance (mH)
Contact Form	Switch Model	Nominal	Max.	Typical (± 10 %)	Max.	Min.	Nominal	Nominal
1A	35/1	5	6.5	140	3.5	1.0	180	18
The Pull-In, Drop-Out Voltage and Coil Resistance will change at rate of 0.4% per °C								

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Relay Data (@ 20°C)		Unit
Dielectric Strength Coil/Contact (min.) According to EN60255-27	5	kVDC
Insulation Resistance Coil/Contact (min.) Rh<45%, 200V Test Voltage	10 ¹²	Ohm
Capacitance Coil/Contact (typ.) @ 10 kHz	1.2	pF
Shock Resistance (max.) Half sine, 6ms, 10 times, 3 axis, 6 directions	30	g
Vibration Resistance (max.) 10-2000 Hz, 3 axes, 12 cycles per axis	20	g
Operating Temperature (max.) Surrounding of the relay's housing	-40 to 105	°C
Storage Temperature (max.) Surrounding of the relay's housing	-40 to 125	°C
Washability Aqueous rinse suitable. Proper drying necessary.	Fully Sealed	

For the list of AEC-Q200 Tests, see page 3

Dimensions (in mm [inch]) Tolerances acc. to ISO 2768-m



Handling & Assembly Instructions

- Switching inductive and/or capacitive loads create voltage and/or current peaks, which may damage the relay. Protective circuits need to be used - contact our sales office.
- External magnetic fields and magnetic effects, due to adjacent relays in high density matrices that may influence the relays' electrical characteristics, must be taken into consideration.
- Mechanical shock impacts, e.g. dropping the relays, may cause immediate or post-installation failure.
- Coil suppression diode may have negative influence on total number of switching cycles, especially when switching high voltage. Zener diode in series with the suppression diode is therefore recommended.
- Reflow soldering: See the page 4. Recommendations given by the soldering paste manufacturer need to be considered as well as the temperature limits of other components/processes.

Life Test Data

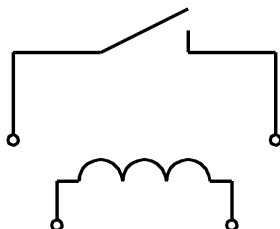
Note: The number of switching cycles is dependent on the switching load and application requirements.

Please contact our office for more information.

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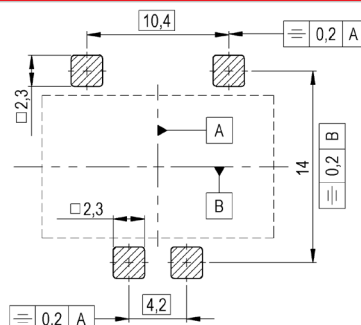
Pin-Out (Top View)

Form A (SMD)



Recommended PCB Pad Layout (Top View) (in mm [inch]) Tolerances acc. to ISO 2768-m

SMD



Tested in accordance with AEC-Q200 standards

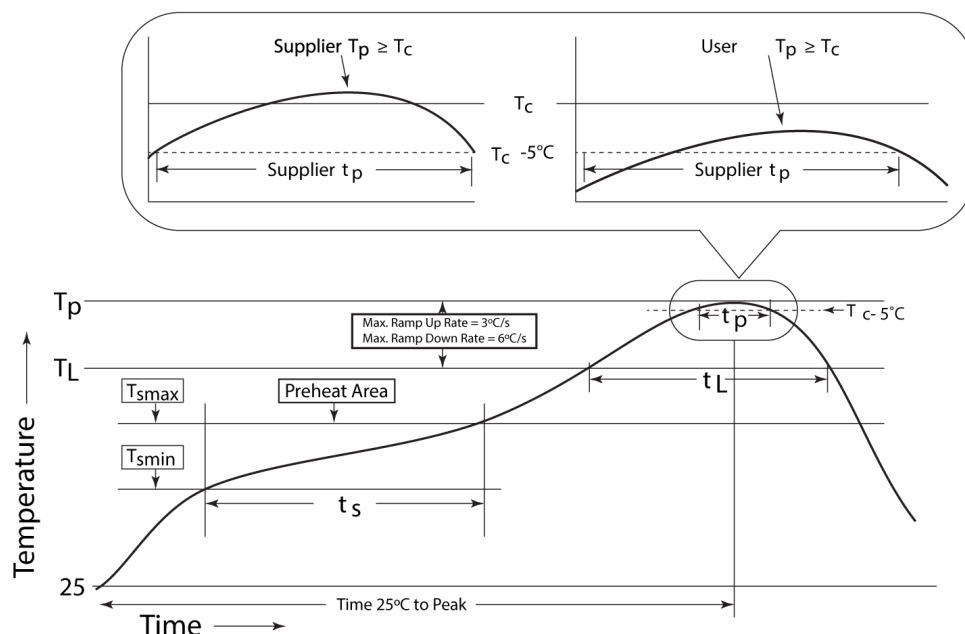
High Temperature exposure 1000 hrs. @+125°C, unpowered	MIL-STD-202 Method 108 IEC 60068-2-2
Temperature cycling 1000 cycles @+125°C / -40°C	MIL-STD-202H Method 107 IEC 60068-2-14
Biased humidity 1000 hrs. @+85°C @85%RH, unpowered	MIL-STD-202H Method 103 IEC 60068-2-67
Operational Life at Dry Heat, Powered 1000 hrs. @+105°C, 1000 VDC / 1 mA	MIL-STD-202H Method 108 IEC 60068-2-2
Terminal Strength (SMD Leads)	AEC-Q200-006 (Attach. 6)
Mechanical Shock 100 g Half sine, 6ms, 10 times, 3 axis, 6 directions	MIL-STD-202H Method 213B IEC 60068-2-27
Mechanical Vibration Sinusoidal 20g 10-2000 Hz, 3 axes, 12 cycles per axis	MIL-STD-202H Method 204D IEC 60068-2-6
Resistance to Soldering Heat	MIL-STD-202G Method 210F
Solderability	J-STD-002D
Board Flex 60 sec. minimum holding time	AEC-Q200-005 (Attach. 5)

Glossary Contact Form

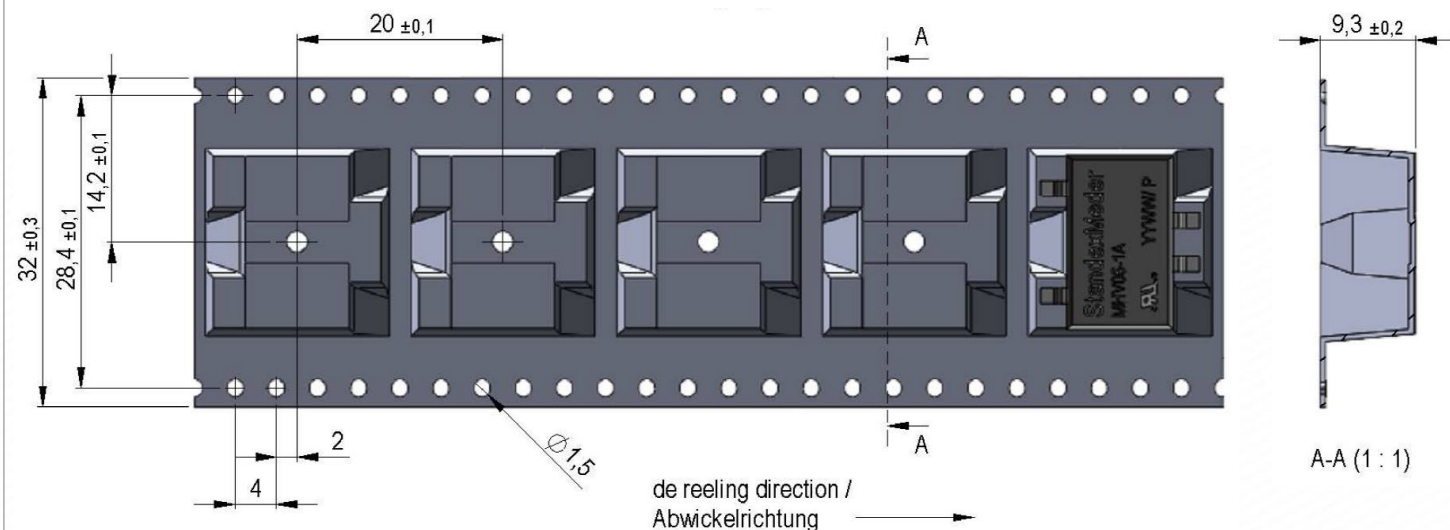
Form A	NO = Normally Open Contacts SPST = Single Pole Single Throw
Form B	NC = Normally Closed Contacts SPST = Single Pole Single Throw
Form C	Changeover SPDT = Single Pole Double Throw
Form E	Latching unchanged until an opposite impulse is present
MHV Relays are available only in "Form A" configuration	

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Recommended Reflow Lead-free Profile (acc. to JEDEC J-STD 020E) For usage with tin Sn96.5/Ag3/Cu0.5



SMD Packaging (Tape&Reel per 300 pcs.)



Please note: All technical specifications on this series datasheet refer to the standard product range. Modifications in the sense of technical progress are reserved. For general information only. For more specific information, please consult the product datasheet, available upon request.

This series datasheet could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein. These change will be incorporated in future revisions.

For deviating values, most current specifications and products please contact your nearest sales office.