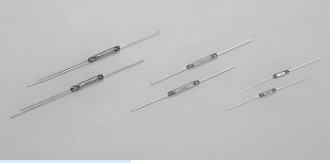
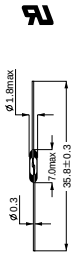
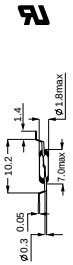


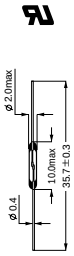
Reed Switches

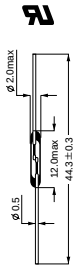
Specifications

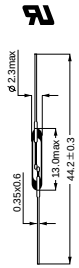
Actual dimensions
All dimensions are in mm.

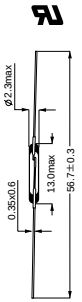


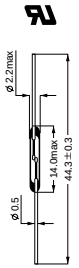


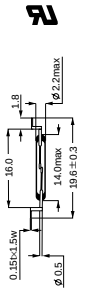


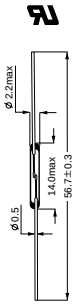












		ORD213	ORD213S-1	ORD211	ORD219	ORD221	ORD2221	ORD228VL	ORD228S-1	ORD2220	Notes
Electrical Characteristics	Contact	1A	1A	1A	1A	1A(OFF SET)	1A(OFF SET)	1 A	1A	1A	
	Pull-in [AT]	10～40	10～40*	10～40	10～30	10～30	10～70	10～50	10～50*	08～40	1
	Drop-out [AT]	5min	5min*	5min	5min	5min	5min	5min	5min*	3min	
	Contact resistance(Initial) [mΩ]	200max	200max*	100max	100max	100max	100max	100max	100max*	100max	2
	Breakdown voltage [DCV]	150min	150max	150min	200min(PI≧20)	200min(PI≧20)	200min(PI≧20)	200min(PI≧20)	200min(PI≧20)	200min	3
	Insulation resistance [Ω]	10^9min	10^9min	10^9min	10^9min	10^9min	10^9min	10^9min	10^9min	10^9min	4
	Electrostatic capacitance [pF]	0.4max	0.4max	0.2max	0.3max	0.3max	0.3max	0.3max	0.3max	0.3max	5
	Contact rating [VA,W]	1.0	1.0	1.0	10	10	10	10	10	16	
	Maximum carry current [A]	0.3	0.3	0.3	1.0	1.0	1.0	1.0	1.0	0.7	6
	Maximum switching voltage [V]	DC24/AC24	DC24/AC24	DC24/AC24	DC100/AC100	DC100/AC100	DC100/AC100	DC100/AC100	DC100/AC100	DC40/AC40	
	Maximum switching current [A]	DC0.1	DC0.1	DC0.1	DC0.5	DC0.3	DC0.3	DC0.5	DC0.5	DC0.4	
Operating Characteristics	Operate time [ms]	0.3max	0.3max	0.3max	0.4max	0.4max	1.0max	0.4max	0.4max	0.4max	7
	Bounce time [ms]	0.3max	0.3max	0.3max	0.3max	0.5max	1.0max	0.3max	0.3max	0.3max	8
	Release time [ms]	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	9
	Resonant frequency [Hz]	11000±2000	11000±2000	7500±500	5900±400	2750±250	2750±400	5000±400	5000±400	4400±400	10
	Maximum operating frequency [Hz]	500	500	500	500	500	500	500	500	500	
Standard coil	Type No.	8	8	8	6	6	6	6	6	6	
Contact material	Rh: Rhodium Ir: Iridium	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	
Features		Super ultra-miniature	Super ultra-miniature SMD	Ultra-miniature	Miniature high-performance	Miniature offset-type	Miniature offset-type long reed	Miniature high-performance	Miniature high-performance SMD	Miniature wide differential	

* Pre-forming

Table 1

Environmental Characteristics

Table 2

	Characteristics (Common to All Types)	Test Conditions	Remarks
Shock	Shall not misoperate with shock of 30G (11 msec) applied	MIL-STD-202G METHOD 213B-J	(a)
Vibration	Shall not misoperate with max. 20G (10-1000Hz)	MIL-STD-202G METHOD 204D-D	(b)
Temperature range	Shall be operational in the range of -40 to 125℃		(c)
Lead tensile strength	Shall withstand against 2 kg static load	MIL-STD-202G METHOD 211A	

(a) If a shock of more than 30G is applied to a reed switch, the pull-in value of the switch will be often caused to change from the standard specification. Therefore, it is recommended not to use the reed switch which has been given such a shock.

(b) If a vibration of more than 1 KHz is applied to a reed switch, even a very small acceleration to it will easily cause the switch to misoperate to close due to its resonant frequency. (10-1000Hz).

(c) In practice the reed switch can operate beyond the specified range. In case of magnet driving, however, some magnets show decrease of magnetic flux even at the lowest temperature of the range depending on their temperature characteristics. Therefore, it is recommended to consider the range as a general guide line.

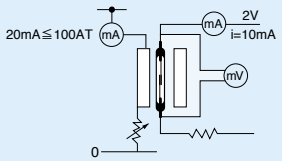
UL recognition number is E70063

Notes

1. Pull-in and drop-out were measured by using our standard coil. Tolerance at measurement is ±2AT. (Fig. 1)
2. Measurements are made by the four-terminal voltage reduction method where the 100AT excitation is given to the switch using our standard coil to close the contacts, and 10 mA current is applied. (Fig. 1)
3. This value varies depending on the pull-in value (contact gap). (MIL-STD-202G METHOD 301)
4. Measurement is made by using a DC 100V super megger. (MIL-STD-202G MET-HOD 302)
5. The values show those at 1 MHz.
6. The value is obtained from the dry test under continuous current flow.
7. The value shows the time required for the contacts to cause the first contact bounce after applying the voltage to our standard test coil. The time is shown at Top in Fig. 2.
8. Bouncing is caused when the contacts close. Bounce time means the time when opening and closing of the contacts are being repeated before the contacts are completely closed. Shown by Tbounce. (Fig. 2)
9. Release time means the time from the moment the voltage applied to the test coil is removed to the moment the contacts open. Shown by Trls. (Fig. 2)
10. Resonant frequency is a vibrating frequency inherent to the reed switch. Avoid application of vibration at this frequency to the switch, otherwise it will cause misoperation.

Fig.1

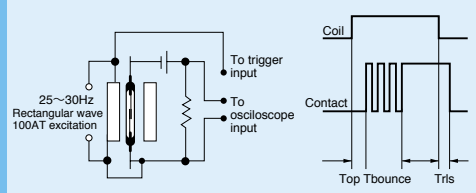
for pull-in, drop-out and contact resistance

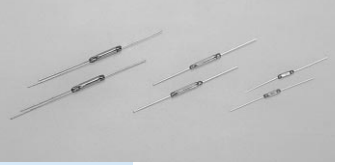


Note 1: Measurements are taken with the center of the coil and the center of the contact of the reed switch aligned, to minimize the effects of the terrestrial magnetism.

Note 2: The soak current (100AT) is first applied, then it reverts to 0AT and a measurement is taken with the current flowing in the same direction as the soak current. The polarity of the electric current applied on the coil must be situated in such a way that the orientation of the field of excitation coincides with that of the terrestrial magnetism (the leader line at the upper section of the coil should be positive).

Fig.2

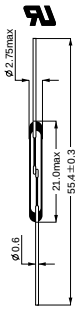


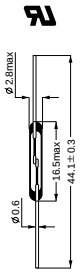


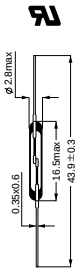
Reed Switches

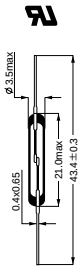
Specifications

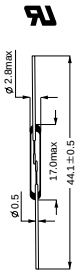
Actual dimensions
All dimensions are in mm.

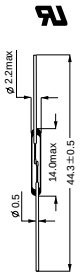


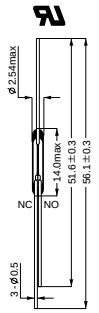


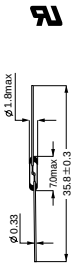


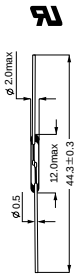












		ORD229	ORD2210	ORD2210V	ORD2211	ORD2212	ORD234	ORD9215	ORD9216	ORT551	ORD311	ORD312	Notes
Electrical Characteristics	Contact	1A	1A	1A	1A	1A	1A	1A	1A	1C	1A	1A	
	Pull-in [AT]	20～60	15～60	20～60	20～60	15～45	15～50	10～50	10～50	10～30	10～30	10～30	1
	Drop-out [AT]	6min	7min	7min	8min	DO/PI>0.8(PI>20)	6min	4min	5min	4min	5min	5min	
	Contact resistance(Initial) [mΩ]	100max	1000max	100max	100max	100max	100max	100max	100max	100max	200max	100max	2
	Breakdown voltage [DCV]	600min(PI≧35)	250min(PI≧20)	1000min	200min(PI≧20)	150min(PI≧20)	250min(PI>20)	150min	150min	200min(PI>20)	250min	250min	3
	Insulation resistance [Ω]	10^{10}min	10^{10}min	10^{10}min	10^{9}min	10^{9}min	10^{9}min	10^{9}min	10^{9}min	10^{9}min	10^{9}min	10^{9}min	4
	Electrostatic capacitance [pF]	0.5max	0.5max	0.5max	0.3max	0.5max	0.5max	0.3max	0.3max	1.5max	0.4max	0.3max	5
	Contact rating [VA,W]	DC50(W)/AC70(VA)	DC50(W)/AC70(VA)	100	50(12V-3.4W Lamp)	10	10	10	10	3	10	30	
	Maximum carry current [A]	2.5	2.5	2.5	2.5	0.5	2.0	1.0	1.0	0.5	1.0	1.0	6
	Maximum switching voltage [V]	DC350/AC300	DC200/AC150	DC350/AC300	DC100/AC100	DC100/AC100	DC200/AC100	DC100/AC100	DC100/AC100	DC30/AC30	DC100/AC100	DC200/AC100	
	Maximum switching current [A]	DC0.7/AC0.5	DC1.0/AC0.7	DC1.0	0.5 In rush 3A	DC0.2	DC0.5	DC0.4	DC0.5	DC0.2	DC0.5	DC0.5	
Operating Characteristics	Operate time [ms]	0.6max	0.6max	0.6max	0.6max	0.4max	0.5max	0.4max	0.4max	1.0max	0.3max	0.4max	7
	Bounce time [ms]	0.5max	0.5max	0.5max	0.4max	1.0max	0.5max	0.4max	0.3max	NO1.0,NC1.5max	0.3max	0.3max	8
	Release time [ms]	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.05max	0.5max	0.05max	0.05max	9
	Resonant frequency [Hz]	2500±250	2500±250	2500±250	4600±500	3900±500	2200±300	3700±300	5000±400	6000±4000	13000±2000	5900±400	10
	Maximum operating frequency [Hz]	500	500	500	500	500	500	500	500	200	500	500	
Standard coil	Type No.	3	3	3	6	6	3	6	6	10	8	6	
Contact material	Rh: Rhodium Ir: Iridium	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Ir	Ir	
Features		High breakdown voltage	High power	Vacuum High power	Lamp load	Closed differential type, Low sound	Long life	General purpose miniature-type	General purpose miniature-type	Ultra-miniature transfer	Super ultra-miniature long-life	High-power long-life	

Table 1

Cutting or Bending of Leads

Since the leads of a reed switch comprise part of the magnetic circuit, shortening the leads by cutting will cause the required ampere turns for pull-in and drop-out to increase as shown in Fig.3. When bending the leads, make sure that the portion nearest to the glass tube be gripped tightly by a jig as shown in Fig.4, so that application of a mechanical stress may not disfigure the sealed portion.

Fig.3

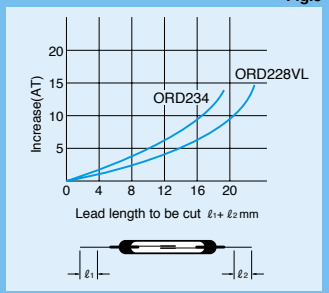
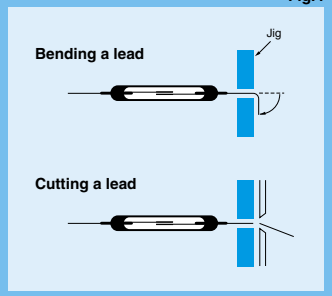


Fig.4



Correlation of product attributes with the characteristic values provided by other manufacturers for their products

Pull-in values differ from one manufacturer to next, due to differences in the methods used to measure characteristic values stipulated by each individual manufacturer. Therefore, differences also exist in the measurement conditions (standard coils and lengths of reed switches may be different). Should there be a need to compare the characteristic values of our reed switches, with those produced by other manufacturers, it would be necessary to correlate the values.

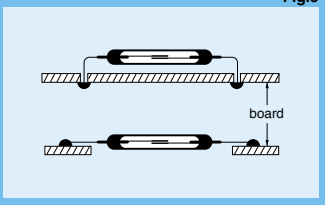
Certified characteristic values of reed switches

The pull-in values (four digit numbers) indicated on the individual packaging of reed switches, are the range values determined at the time of product sorting. The certified pull-in values have a tolerance of ±2AT on these range values. For example, the certified pull-in value for ORD211 (2025) is 18 to 27AT.

Installation of reed switches

An ordinary soldering iron can be used (at 250 to 300 degrees Celsius) on the lead, as they are processed with tin-plating. Please make sure that the soldering is performed at least 1mm away from the edge of the glass. Please try to minimize the amount of processing time, as prolonged application of heat by the soldering iron may cause abnormalities at the lead seals. When installing on a printed circuit board, either lift the reed switch above the board surface, as shown in Fig.5, or drill holes on the board to ensure that the glass on the reed switch does not come into contact with the board.

Fig.5



Dropping reed switches

It is absolutely imperative that reed switches are not dropped.
Dropping a reed switch onto a hard surface, from a height of 30cm or more, can result in the fatal deterioration of its features, so please be careful when handling reed switches. Further, care should also be taken when machine processing the reed switches, as an impact arising from such processes, can cause harm as well.