SPECIFICATIONS

DESCRIPTION

Reed Relays consist of a reed switch and coil fitted into a housing, which could be plastic, metal or moulded. Compared with electro-mechanical relays, reed relays generally have a faster response time, lower coil consumption and are smaller in size. Furthermore, the switch is sealed in a dry, inert atmosphere preventing the ingress of contaminants.

OPERATION

High Voltage Relays have outstanding performance in insulation and stand-off voltage. Energizing the coil operates a reed switch causing the contacts to open or close. It is important that the switch is not overloaded by applying loads in excess of the switch ratings. For details on switch loads refer to the reed relay specifications and the reed switch application page in this catalogue.

Vibration and Shock Resistance

During the evaluation of vibration and shock resistance, the relays are driven with nominal voltage. The switches should not open longer than 10 µsec.

	Normally Open	Change Over	Wetted
Vibration Resist.	20g / 5...2000 Hz	10g / 5...500 Hz	10g / 10...500 Hz
Shock Resistance	100g / 11ms Sine half wave	50g / 11ms Sine half wave	30g / 11ms Sine half wave

Washability

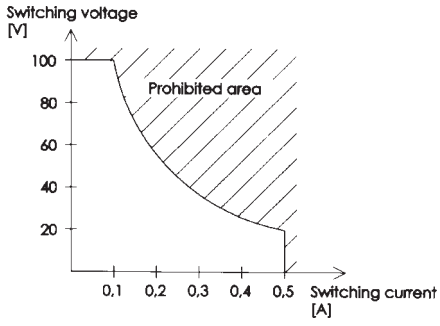
Resistant to Caltron, Freon, alcohol and distilled (pure) water. During the final rinsing phase only the purest substances should be used.

Pull-in and Drop-out Voltage, Coil Resistance

The tolerances indicated are valid at 25°C ± 3°C. The temperature coefficient of the coil resistance is 0,4 % / °C.

Switching Voltage, Current and Capacity

The parameters as listed for switching voltage, current and capacity are maximum values. Exceeding any one of these values causes overload and reduces relay life expectancy.



Contact Resistance

The contact resistance indicated is valid for new relays at nominal coil voltage. The four-point method at 2VDC / 100mA or 10 mA is applied. Custom solutions for special applications, especially for switching signals smaller than 1mV at 10µA (low-level-applications) or applications requiring dynamic contact resistance measurement can be produced for special switching needs.

General Parameters

Life Expectancy

The life expectancy of a Reed Relay is at least 10^5...10^6 operations at nominal load. At minimum load the life expectancy can be up to 5 x 10^8 operations. The mechanical life expectancy is 10^9 operations (minimum). Through the switching of higher loads, especially inductive or capacitive and lamp loads, life expectancy can be considerably reduced due to exceeding the permissible maximum current.

Thermal Resistance of the DIL-SIL-Reed Relays: 70 K/W.

Thermoelectric Voltage

Between FeNi (Reed Switch) and Cu (PCB) a thermoelectric voltage $U_{th} = k \times (T_1-T_2)$ occurs with the constant k = 50 µV/°C (T=temperature).

Capacitance

The capacitance parameters are regarded as typical and are calculated for versions without shielding:

Capacitance, measured...	N.O.	N.O. wetted	Change Over
across open contact	0,8 pF	1,8 pF	2,5 pF
between open contact and coil	1,5 pF	3,6 pF	2,5 pF
between closed contact and coil	3,0 pF	7,0 pF	2,5 pF

Solderability

All relays meet the DIN 8505 requirements.
Hole Diameter in PCB: Ø 0.65mm

Temperature Range

The operating temperature of the relay is the equivalent of the internal temperature. If the relays are used in ambient temperatures (J_a) higher than 20°C, the maximum permissible operating voltage (U_T) must be calculated according to the table indicated below, using the formula:

$U_T = U_{max} \times k_1$

(U_{max} = max. permissible operating voltage)

ϑ_a (°C)	20	30	40	50	60	70
k_1	1,00	0,96	0,92	0,88	0,84	0,80

Switching Time

When using dry Reed Switches in relays, contact bounce may occur.
Pull-in time (incl. bounce time) typ. 0,5...1,8 ms
at nominal voltage and 20 Hz
Drop-out time (with diode) typ. 0,5...1,5 ms
at nominal voltage and 20 Hz

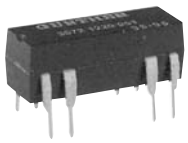
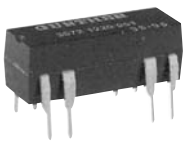
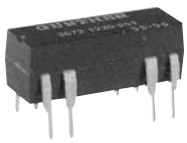
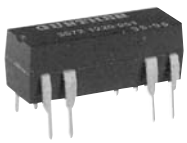
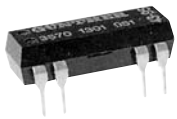
Magnetic Shieldings

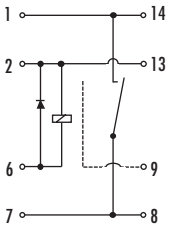
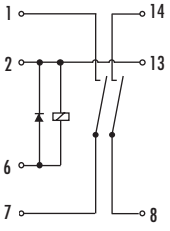
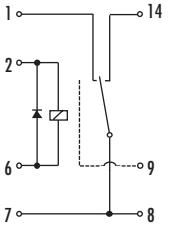
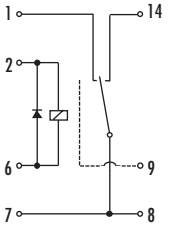
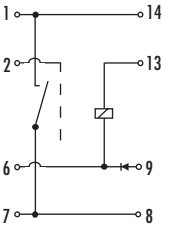
Magnetic shieldings for Reed Relays are also available:
- magnetic sheildings for SIL-Reed Relays:
- top side and side by side
- top side and front end
- top side, side by side and front end
- magnetic shieldings for DIL-Reed Relays:
- top side, side by side and front end suitable for the DIL-High profile

Comment

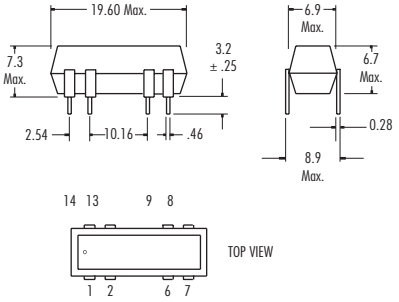
Relay versions with 15 V nominal coil voltage are available for orders exceeding min. quantity of 1,000 pieces.

Reed Relays - DIL / SIL - Dry Contact

Type		**3570 1210 ...**			**3572 1220 ...**			**3563 1231 ...**			**3573 1231 ...**			**3570 1301 ...**		
Style		**DIL - High Profile**			**DIL - High Profile**			**DIL - High Profile**			**DIL - High Profile**			**DIL - Low Profile**		
Contact Form		**1 Form A**			**2 Form A**			**1 Form C**			**1 Form C**			**1 Form A**		
Versions Available		**1, 3 and 4**			**1 and 3**			**1, 3 and 4**			**1, 3 and 4**			**1, 3 and 4**		
Coil Parameters																
Nominal Coil Voltage	VDC	5	12	24	5	12	24	5	12	24	5	12	24	5	12	24
Pull-in Voltage	VDC Max.	3.8	9	18	3.8	9	18	3.8	9	18	3.5	8	16	3.8	9	18
Drop-out Voltage	VDC Min.	0.8	1	2	0.8	1	2	1	2	4	1	2	4	0.8	1	2
Operating Voltage	VDC Max.	20	30	40	10	20	40	10	18	35	10	18	35	15	20	30
Coil Resistance	(±10%) Ω	500	1000	2150	140	500	2150	200	500	2150	200	500	2150	500	1000	2000
Contact Parameters																
Switching Capacity	W/VA Max.	10			10			3			5			10		
Switching Voltage	V Max.	100AC/DC			100AC/DC			70 AC /100 DC			100AC/DC			100AC/DC		
Switching Current	A Max.	0.5			0.5			0.25			0.5			0.5		
Carrying Current	A Max.	1.0			1.0			0.5			1.0			1.0		
Contact Resistance	mΩ Max.	150			150			200			150			150		
Dielectric Strength	VDC Min.	200			200			140			200			200		
Relay Parameters																
Dielectric Strength	Coil/Contact VDC	1000			1000			1000			500			1000		
Insulation Resistance	Coil/Contact Ω	10^{10}			10^{10}			10^{10}			10^{10}			10^{10}		
Storage Temperature	Deg. °C	-40 +105			-40 +105			-40 +105			-40 +105			-40 +105		
Operating Temperature	Deg. °C	-35 +80			-35 +80			-35 +80			-35 +80			-35 +80		
Pull-in Time incl. Bounce Time max.	ms	0.5			0.5			2.0			1.2			0.5		
Drop-out Time with Diode	ms	0.5			0.5			3.0			0.8			0.5		
Weight approx.	g	2.3			2.3			2.3			2.3			1.8		
Pin Configuration (top view)																

DIL-High Profile

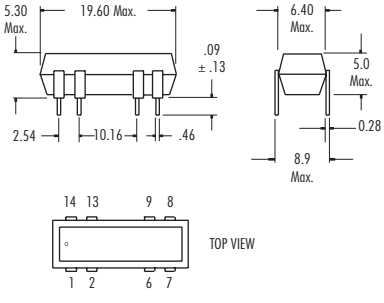


How to Order:

3570 1210 05 1

- Contact code
- Type Number
- Nominal coil voltage
  - 05 = 5V
  - 12 = 12V
  - 24 = 24V
- Version
  - 1 = without diode
  - 3 = with diode
  - 4 = with electrostatic shielding and diode

DIL-Low Profile

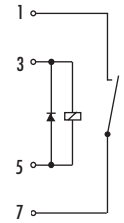


All dimensions are nominal, in millimetres unless otherwise stated.
As part of the groups policy of continued product improvement, specifications may change without notice. Our sales office will be pleased to help you with the latest information on our products.

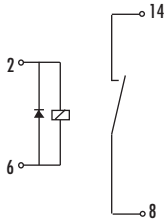
Reed Relays - DIL / SIL - Dry - Wetted

	Dry	Dry	Wetted	Wetted
				Non Position sensitive
				
Type	**3570 1331...[1)]**	**3570 1511...**	**3582 7251**	**3585 7251**
Style	**SIL**	**Surface Mount**	**DIP**	**DIP**
Contact Form	**1 Form A**	**1 Form A**	**1 Form A**	**1 Form A**
Versions Available	**1 and 3**	**1 and 3**	**1 and 3**	**1 and 3**
Nominal Voltage V.	5 / 12 / 24	5 / 12 / 24	5 / 12 / 24	5 / 12 / 24
Coil Resistance (+10%) Ω	500 / 1.000 / 2.000	500 / 1.000 / 2.150	105 / 500 / 2150	140 / 500 / 2150
Operate Voltage V.	3.8 / 9 / 18	3.8 / 9 / 18	3.75 / 9 / 18	3.75 / 9 / 18
Release Voltage V.	0.8 / 1.5 / 2	0.8 / 1 / 2	0.5 / 1 / 2	0.5 / 1 / 2
Nominal Input Power mW	- / - / -	- / - / -	238 / 288 / 268	179 / 288 / 268
Max Voltage Max. V.	15 / 30 / 40	20 / 30 / 40	10 / 20 / 40	10 / 20 / 40
Switch Parameters				
Switching Voltage Max. DC/Peak AC Resist	100V	100V	500V	500V
Switching Current Max. DC/Peak AC Resist	0.5A	0.5A	2A	2A
Carrying Current (24h) Max. DC/Peak AC Resist	1.0	1.0	3A	2A
Contact Rating Max. DC/Peak AC Resist	10	10	50W Max.	50W Max.
Life Expectancy Signal Level 1.0V, 10mA	-	-	1000 x 10^6 Ops Min.	500 x 10^6 Ops Min.
Rated loads				
50V, 1A	-	-	2 x 10^6 Ops Min.	1 x 10^6 Ops Min.
500V, 100mA	-	-	2 x 10^6 Ops Min.	5 x 10^6 Ops Min.
Static Contact Resistance 50mV, 10mA	150 mΩ max.	150 mΩ max.	100 mΩ max.	100 mΩ max.
Contact Material	Rh	Rh	Hg	Hg
Hg Content	-	-	40 mg	16 mg
Relay Parameters				
Insulation Resistance	10	10	10	10
Between all insulated pins at 500V, 25°C,40%RH	10^{10} (at 100V)	10^{10} (at 100V)	10^{12} (at 100V)	10^{11} (at 100V)
Capacitance Across Open Contacts	1.3 pF Typ.	1.5 pF Typ.	0.7 pF Typ.	1.5 pF Typ.
Open Contacts to Coil	3 pF Typ.	3 pF Typ.	1.2 pF Typ.	3 pF Typ.
Closed Contact to Coil	-	-	3.2 pF Typ.	-
Dielectric Strength Between Contacts	200 Vdc	200 Vdc	2000 Vdc/Peak AC	1500 Vdc/Peak AC
Contacts to Coil	1000 Vac	4000 Vac	1000 Vac	1000 Vac
Operating Time (Time incl. Bounce)	0.5	1.0	-	-
At Nominal Coil Voltage 10Hz Sq. Wave, 50%DC	0.5ms Max.	0.1ms Max.	2.5ms Max.	1.75ms Max.
Release Time Zena-Diode Suppression	0.5A ms Max.	1.0A ms Max.	2.5A ms Max.	1.5A ms Max.
Storage Temperature Deg °C	-40 +105	-40 +105	-40 +105	-40 +105
Operating Temperature At V nom. Deg. °C	-35 +80	-35 +80	-38 +75	-38 +75
Soldering Temperature 10 sec maximum Deg. °C	+260	+260	+260	+260
Vibration resistance (Survival) 10 Hz-500 Hz	10g	10g	10g	10g
Shock Resistance (Survival) 11±1ms, 1/2 Sine Wave	30g	30g	30g	30g
Weight	1.6	1.6	2.4g	2.4g
Dimensions Length: mm Max.	19.05	19.6	19.6	19.6
Width: mm Max.	6.8	6.9	6.9	6.9
Height: mm Max.	7.62	6.9	7.33	7.33

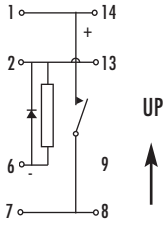
3570 1331...[1)]



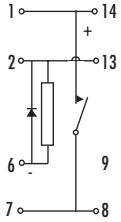
3570 1511...



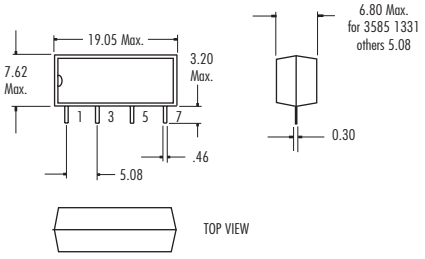
3582 7251...



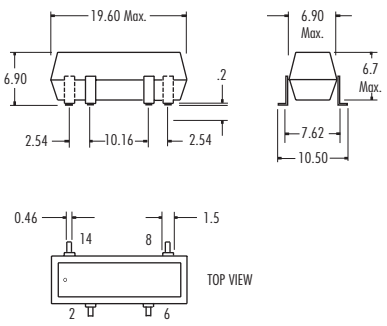
3585 7251...



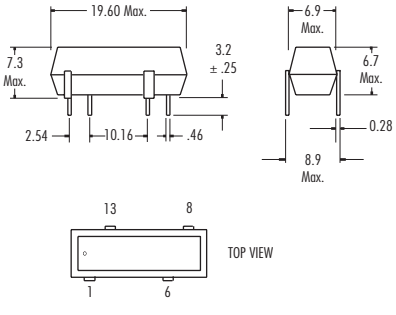
SIL



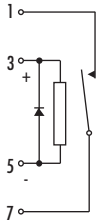
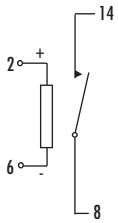
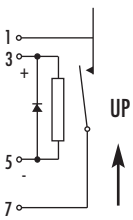
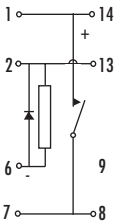
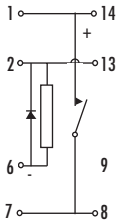
DIL-Surface Mount



DIL-High Profile



Reed Relays - SIP / DIP - Wetted Contact

	Non Position Sensitive			Non Position Sensitive									Non Position Sensitive		
															
Type	**3585 1331**			**3585 7511**			**3582 7331**			**3582 7210**			**3585 1210**		
Style	**SIP**			**DIP**			**SIP**			**DIP**			**DIP**		
Contact Form	**1 Form A**			**1 Form A**			**1 Form A**			**1 Form A**			**1 Form A**		
Nominal Voltage V.	5	12	24	5	12	24	5	12	24	5	12	24	5	12	24
Coil Resistance (+10%) Ω	140	500	2150	140	500	2150	105	500	2150	105	500	2150	140	500	2150
Operate Voltage V.	3.75	9	18	3.75	9	18	3.75	9	18	3.75	9	18	3.75	9	18
Release Voltage V.	0.5	1	2	0.5	1	2	0.5	1	2	0.5	1	2	0.5	1	2
Nominal Input Power mW	179	288	268	179	288	268	238	288	268	238	288	268	179	288	268
Max Voltage Max. V.	10	20	40	10	20	40	10	20	40	10	20	40	10	20	40
Switch Parameters															
Switching Voltage Max. DC/Peak AC Resist	500V			500V			500V			500V			500V		
Switching Current Max. DC/Peak AC Resist	2A			2A			2A			2A			2A		
Carrying Current (24h) Max. DC/Peak AC Resist	2A			2A			3A			3A			2A		
Contact Rating Max. DC/Peak AC Resist	50W Max.			50W Max.			50W Max.			50W Max.			50W Max.		
Life Expectancy Signal Level 1.0V, 10mA	500 x 10^6 Ops Min.			500 x 10^6 Ops Min.			1000 x 10^6 Ops Min.			1000 x 10^6 Ops Min.			500 x 10^6 Ops Min.		
Rated loads															
50V, 1A	1 x 10^6 Ops Min.			1 x 10^6 Ops Min.			2 x 10^6 Ops Min.			2 x 10^6 Ops Min.			1 x 10^6 Ops Min.		
500V, 100mA	5 x 10^6 Ops Min			5 x 10^6 Ops Min			50 x 10^6 Ops Min			50 x 10^6 Ops Min			5 x 10^6 Ops Min		
Static Contact Resistance 50mV, 10mA	100 mΩ Max.			100 mΩ Max.			100 mΩ Max.			100 mΩ Max.			100 mΩ Max.		
Contact Material	Hg			Hg			Hg			Hg			Hg		
Hg Content	16 mg			16 mg			40 mg			40 mg			16 mg		
Relay Parameters															
Insulation Resistance															
Between all insulated pins at 500V, 25°C,40%RH	10^{11} Ω Typ.			10^{11} Ω Typ.			10^{12} Ω Typ.			10^{12} Ω Typ.			10^{11} Ω Typ.		
Capacitance Across Open Contacts	1.3 pF Typ.			1.5 pF Typ.			0.8 pF Typ.			0.7 pF Typ.			1.5 pF Typ.		
Open Contacts to Coil	3 pF Typ.			3 pF Typ.			2.2 pF Typ.			1.2 pF Typ.			3 pF Typ.		
Closed Contact to Coil							3.3pF Typ.			3.2pF Typ.			-		
Dielectric Strength Between Contacts	2000 VDC/Peak AC			1500 VDC/Peak AC			2000 VDC/Peak AC			2000 VDC/Peak AC			1500 VDC/Peak AC		
Contacts to Coil	1000 Vac			4000 Vac			1000 Vac			1000 Vac			1000 Vac		
Operating Time															
At Nominal Coil Voltage 10Hz Sq. Wave, 50%DC	1.75 ms Max.			1.75 ms Max.			1.5 ms Max.			2.5 ms Max.			1.75 ms Max.		
Release Time Zena-Diode Suppression	1.5 ms Max.			1.5 ms Max.			1 ms Max.			2.5 ms Max.			1.5 ms Max.		
Storage Temperature Deg °C	-40 +105			-40 +105			-40 +105			-40 +105			-40 +105		
Operating Temperature At V nom. Deg. °C	-38 +75			-38 +75			-38 +75			-38 +75			-38 +75		
Soldering Temperature 10 sec maximum Deg. °C	+260			+260			+260			+260			+260		
Vibration resistance (Survival) 10 Hz-500 Hz	10g			10g			10g			10g			10g		
Shock Resistance (Survival) 11±1ms, 1/2 Sine Wave	30g			30g			30g			30g			30g		
Weight	2.4g			2.3g			2.4g			2.4g			2.4g		
Dimensions Length: mm Max.	19.05			19.6			19.05			19.6			19.6		
Width: mm Max.	6.7			6.9			6.7			6.9			6.9		
Height: mm Max.	8.2			6.9			8.2			7.33			7.33		
															
	Non-Position Sensitive Wetted Relay			Non-Position Sensitive Wetted Relay for Surface Mounting			High performance Reability Wetted Relay			High performance Reability Wetted Relay			Non-Position Sensitive Wetted Relay		

How to order wetted Reed Relays

NOTE: Vertical mounting required (+30° from vertical)
Type 3582 7331 Type 3582 1210

3582 7331 XX X

Nominal Coil Voltage
05 = 5V
12 = 12V
24 = 24V

Version
1 = Standard
3 = Diode

All dimensions are nominal, in millimetres unless otherwise stated.
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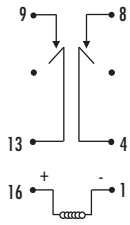
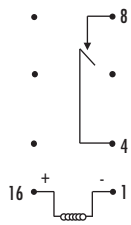
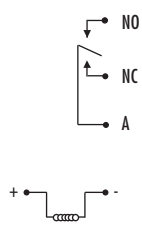
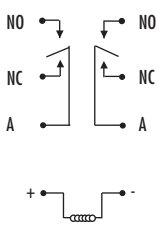
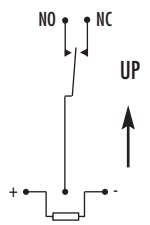
Reed Relays - SIP / DIP - Wetted Contact

	Non Position Sensitive	Non Position Sensitive			
					
Type	3885 7811	3885 7801	3880 7821	3880 7831	3880 7711
Style	DIP	DIP	DIP	DIP	-
Contact Form	2 Form A	1 Form A	1 Form C	2 Form C	1 Form C
Nominal Voltage V.	5 12 24 48	5 12 24 48	5 15 24 40	5 12 24 48	5 12 24 48
Coil Resistance (+10%) Ω	80 430 1750 6900	80 430 1750 6900	44 280 1050 4100	44 280 1050 4100	155 655 2450 9500
Operate Voltage V.	3.75 9 18 36	3.75 9 18 36	3.75 9 18 36	3.75 9 18 36	3.75 9 18 36
Release Voltage V.	0.5 1 2 4	0.5 1 2 4	0.5 1 2 4	0.5 1 2 4	0.4 1 2 4
Nominal Input Power mW	313 335 329 334	313 335 329 334	568 514 549 562	568 514 549 562	161 220 235 243
Max Voltage Max. V.	9 21 43 86	9 21 43 86	7 17 33 65	7 17 33 65	15 30 59 116
Switch Parameters					
Switching Voltage Max. DC/Peak AC Resist	500V	500V	500V	500V	500V
Switching Current Max. DC/Peak AC Resist	2A	2A	2A	2A	2A
Carrying Current (24h) Max. DC/Peak AC Resist	2A	2A	3A	3A	3A
Contact Rating Max. DC/Peak AC Resist	50W Max.	50W Max.	50W Max.	50W Max.	50W Max.
Life Expectancy Signal Level 1.0V, 10mA	500 x 10^6 Ops Min.	500 x 10^6 Ops Min.	1000 x 10^6 Ops Min.	1000 x 10^6 Ops Min.	1000 x 10^6 Ops Min.
Rated loads 48V, 10mA			200 x 10^6 Ops Min.	200 x 10^6 Ops Min.	200 x 10^6 Ops Min.
50V, 1A	1 x 10^6 Ops Min.	1 x 10^6 Ops Min.	2 x 10^6 Ops Min.	2 x 10^6 Ops Min.	2 x 10^6 Ops Min.
500V, 100mA	5 x 10^6 Ops Min	5 x 10^6 Ops Min	50 x 10^6 Ops Min	50 x 10^6 Ops Min	50 x 10^6 Ops Min
Static Contact Resistance 50mV, 10mA	150 mΩ Max.	150 mΩ Max.	150 mΩ Max.	150 mΩ Max.	70 mΩ Max.
Contact Material	Hg	Hg	Hg	Hg	Hg
Hg Content	16 mg	16 mg	72 mg	72 mg	72 mg
Relay Parameters					
Insulation Resistance					
Between all insulated pins at 500V, 25°C,40%RH	10^{11} Ω Typ.	10^{11} Ω Typ.	10^{11} Ω Typ.	10^{11} Ω Typ.	10^{11} Ω Typ.
Capacitance Across Open Contacts	0.9 pF Typ.	0.9 pF Typ.	1.5 pF Typ.	1.0 pF Typ.	1.2 pF Typ.
Open Contacts to Coil	1.8 pF Typ.	1.8 pF Typ.	1.2 pF Typ.	1.2 pF Typ.	1.7 pF Typ.
Closed Contact to Coil			3.0pF Typ.	3.0 pF Typ.	3.2pF Typ.
Dielectric Strength Between Contacts	1400 VDC/Peak AC	1400 VDC/Peak AC	1400 VDC/Peak AC	1400 VDC/Peak AC	1000 VDC/Peak AC
Contacts to Coil	1000 Vac	1000 Vac	1000 Vac	1000 Vac	1000 Vac
Operating Time					
At Nominal Coil Voltage 10Hz Sq. Wave, 50%DC	1.75 ms Max.	1.75 ms Max.	2.5 ms Max.	5 ms Max.	3.0 ms Max.
Release Time Zena-Diode Suppression	1.7 ms Max.	1.7 ms Max.	1.7 ms Max.	5 ms Max.	2.5 ms Max.
Storage Temperature Deg °C	-40 +105	-40 +105	-40 +105	-40 +105	-40 +105
Operating Temperature At V nom. Deg. °C	-38 +75	-38 +75	-38 +75	-38 +75	-38 +75
Soldering Temperature 10 se maximum Deg. °C	+260	+260	+260	+260	+260
Vibration resistance (Survival) 10 Hz-500 Hz	10g	10g	10g	10g	10g
Shock Resistance (Survival) 11±1ms, 1/2 Sine Wave	30g	30g	30g	30g	30g
Weight	3.4g	3.2g	3.2g	3.4g	8g
Dimensions Length: mm Max.	.795 (20.2)	.795 (20.2)	.795 (20.2)	.795 (20.2)	1.181 (30.0)
Width: mm Max.	.386 (9.8)	.386 (9.8)	.386 (9.8)	.386 (9.8)	.457 (11.6)
Height: mm Max.	.425 (10.8)	.425 (10.8)	.425 (10.8)	.425 (10.8)	.425 (10.8)
					
	Non-Position Sensitive Wetted Relay	Non-Position Sensitive Wetted Relay	High performance Reability Wetted Relay	Miniature wetted Changeover Relay	Hg Wetted Relay

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