

DIL AND SIL REED RELAYS

Type	3570.1210.xxx	3570.1301.xxx	3570.1341.xxx	3570.1511.xxx	3572.1220.xxx	3563.1231.xxx	3573.1231.xxx	3565.1231.xxx	3570.1331.xxx	3570.1332.xxx	3570.1321.xxx
Series	PRMA 1A	PRME 1A	DSS7 S 1A	SMD1 1A	PRMA 2A	PRMA 1C	PRMA 1C	PRMA 1C	DSS4/SIP 1A	DSS4/SIP 1A	SIL 1A
Contact Form	IA - Normally Open	IA - Normally Open	IA - Normally Open	IA - normally open	2A - normally open	IC - Change Over	IC - Change Over	IC - Change Over	IA - normally open	IA - normally open	IA - normally open
Features	- Industry Standard - RoHS Compliant	- Industry Standard - RoHS Compliant	- High I/O Isolation - RoHS Compliant	- High I/O Isolation - RoHS Compliant	- Industry standard - RoHS Compliant	- Industry standard - RoHS Compliant	- Higher switching requirements - RoHS Compliant	- High switching power - RoHS Compliant	- Industry standard - RoHS Compliant - ATE version available as 3570.1333.xx for high reliability	- Low input power - RoHS Compliant	- Industry standard - RoHS Compliant
Nominal Voltage	VDC	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24
Must Operate / Pull in Voltage	Max. VDC	3.80 9 18	3.80 9 18	3.75 9 18	3.75 9 18	3.80 9 18	3.80 9 18	3.50 8 16	3.80 9 18	3.80 9 18	3.80 9 18
Must Release / Drop out Voltage	Min. VDC	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2	0.80 1 2
Maximum Voltage	VDC	10 20 28	15 20 30	20 30 40	20 30 40	10 18 35	10 18 35	10 18 35	10 20 28	10 28	10 20 28
Nominal Input Power	mW	50 144 268	50 272 288	50 144 268	50 144 268	179 288 268	125 288 268	125 288 268	50 144 288	25 48	50 144 288
Coil Resistance +/- 10 %	Ohms	500 1000 2150	500 1000 2000	500 1000 2150	500 1000 2150	140 500 2150	200 500 2150	200 500 2150	500 1000 2000	1000 3000	500 1000 2000
Switching Power	Max. W/VA	10	10	10	10	10	3	5	10	10	10
Switching Voltage	Max. VDC/VAC	200	200	200	200	100/70	100	150	200	200	200
Switching Current	Max. A	0.50	0.50	0.50	0.50	0.50	0.50	1	0.50	0.50	0.50
Carry Current	Max. A	1	1	1	1	1	0.50	1	2	2	2
Contact Resistance	m Ohms	Min Typ Max 150	Min Typ Max 150	Min Typ Max 150	Min Typ Max 150	Min Typ Max 150	Min Typ Max 150	Min Typ Max 150	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100
Dielectric strength Across Open Contact	VDC/VACpeak	200	200	200	200	200	140	200	250	250	250
Capacitance Across Open Contact	pF	0.70 1	0.80 1	0.70 1	0.70 1	2.50 3	2.50 3	2.50 3	0.70 1	0.70 1	0.70 1
Switching Frequency	Hz	500	500	500	500	250	250	250	500	500	500
Life Expectancy Signal Level IV-10mA	x10 ⁶ Operations	300 500	300 500	300 500	300 500	20	20	20	300 500	300 500	300 500
Contact Material	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh	Rh
Dielectric Strength Coil-Contact	VAC	1000	1000	4000	4000	1000	1000	500	1000	1800	1800
Insulation Resistance	Ohms	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²
Capacitance Open Contact to Coil	pF	1.50 2	1.50 2	1.50 2	1.50 2	3	3	3	1.50 2	1.50 2	1.50 2
Operate or Pull in Time Incl. Bounce	ms	0.25 0.50	0.25 0.50	0.25 0.50	0.25 0.50	1.20	2.60	0.25 0.50	0.25 0.50	0.25 0.50	0.25 0.50
Release or Drop Out Time With Diode	ms	0.25 0.50	0.25 0.50	0.25 0.50	0.25 0.50	0.25 0.50	0.80	0.50	0.25 0.50	0.25 0.50	0.25 0.50
Operating Temperature	°C	-40 85	-40 85	-40 85	-40 85	-40 85	-40 85	-40 85	-40 85	-40 85	-40 85
Storage Temperature	°C	-50 125	-50 125	-50 125	-50 125	-40 125	-40 125	-40 125	-40 125	-40 125	-40 125
Shock Resistance	g	100	100	100	100	50	50	50	100	100	100
Vibration Resistance	g	20	20	20	20	10	10	10	20	20	20
Soldering Temp. 10 sec.	°C	260	260	260	260	*	260	260	260	260	260
Weight (approx.)	grams	1.80	1.80	2.30	2.30	2.30	2.30	2.30	1.60	1.60	2
Dimensions	Package Style	Package Style 1	Package Style 1	Package Style 2	Package Style 3	Package Style 1	Package Style 4	Package Style 4	Package Style 4	Package Style 5	Package Style 5
Pin Configuration (top view)											

* Suitable for SMD solder process

GENERAL INFORMATION

DESCRIPTION
Reed relays consist of a reed switch and coil assembled into a housing, which could be plastic, metal or molded. The reed switches consist of two or three ferro-magnetic blades, which are hermetically sealed in an inert atmosphere within a glass tube, preventing the ingress of contaminants. It also minimizes arcing and contact damage.

Compared with electro-mechanical relays, reed relays are smaller in size and generally have a faster response time, lower power consumption and longer life. They can also directly be driven by TTL/CMOS. Compared with solid state relays, reed relays have a real galvanic isolation between input and output. The leakage current and the ON-resistance is much lower. Reed relays also can offer a higher dielectric strength.

OPERATION

Reed relays have outstanding performance in insulation and stand-off voltage. Energizing the coil operates a reed switch, causing the contacts to close, to open or to change over. 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 in the technical table or on specific data sheets.

Washability
Resistant to most of the common cleaning fluids. 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.

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 contacts
Vibration Resist.	20 g / 5...2000 Hz	10 g / 5...500 Hz	10 g / 10...500 Hz
Shock Resistance	100 g / 11ms Sine half wave	50 g / 11ms Sine half wave	30 g / 11ms Sine half wave

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 10mA is applied. Custom solutions for special applications, especially for switching signals smaller than 1 mV and 10 µA (low level applications) or applications requiring dynamic contact resistance measurement can be produced for special switching needs.

Type	3570.1326.xxx	3585.1210.xxxx	3582.7210.xxxx	3585.7251.xxxx	3582.7251.xxxx	3585.7511.xxxx	3585.1331.xxxx	3582.7331.xxxx	3885.7811.xxxx	3882.7811.xxxx	3880.7831.xxxx	
Series	SIL 1A	MSS2 1A	MVS2 1A	MSS7 1A - GRMA	MVS7 1A - GRMA	SMD6 1A	MSS4 1A	MVS4 1A	MSS6 2A	MVS6 2A	HGM 2C	
Contact Form	IA - normally open	IA - normally open	IA - normally open	IA - normally open	IA - normally open	IA - normally open	IA - normally open	IA - normally open	2A - normally open	2A - normally open	2C - change over	
Features	- Industry standard - ATE relay - RoHS Compliant	- Wetted, no bounce - All position mounting - High performance	- Wetted, no bounce - High performance - High reliability / long life	- Wetted, no bounce - All position mounting - High performance - High reliability / long life - 4KV I/O isolation / ATE	- Wetted, no bounce - All position mounting - High performance - High reliability / long life - 4KV I/O isolation / ATE	- Wetted, no bounce - All position mounting - High performance - High reliability / long life - 4KV I/O isolation / ATE	- Wetted, no bounce - All position mounting - High performance - High reliability / long life - ATE relay	- Wetted, no bounce - High performance - High reliability / long life - IA also available	- Wetted, no bounce - High performance - High reliability / long life - IA also available	- Wetted, no bounce - All position mounting - High performance - High reliability / long life - IA also available	- Wetted, no bounce - High performance - High reliability / long life - IA also available	- Wetted, no bounce - High performance - High reliability / long life - IC also available
Nominal Voltage	VDC	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	5 12 24	
Must Operate / Pull in Voltage	Max. VDC	3.80 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	3.75 9 18	
Must Release / Drop out Voltage	Min. VDC	0.80 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	0.50 1 2	
Maximum Voltage	VDC	10 20 28	10 20 40	10 20 40	10 20 40	10 20 40	10 20 40	10 20 40	9 21 43	9 21 43	7 17 33	
Nominal Input Power	mW	50 144 275	179 288 268	238 288 268	179 288 268	238 288 268	179 288 268	238 288 268	313 335 329	313 335 329	568 514 549	
Coil Resistance +/- 10 %	Ohms	500 1000 2100	140 500 2150	105 500 2150	140 500 2150	105 500 2150	140 500 2150	105 500 2150	80 430 1750	80 430 1750	44 280 1050	
Switching Power	Max. W/VA	25	50	50	50	50	50	50	50	50	50	
Switching Voltage	Max. VDC/VAC	1000	500	500 (1000V with limited current)	500	500 (1000V with limited current)	500	500	500 (1000V with limited current)	500	500 (1000V with limited current)	
Switching Current	Max. A	1	2	2	2	2	2	2	2	2	2	
Carry Current	Max. A	2	2	3	2	3	2	3	2	3	3	
Contact Resistance	m Ohms	Min Typ Max 150	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 100	Min Typ Max 150	
Dielectric strength Across Open Contact	VDC/VACpeak	2500	1500	2000	1500	2000	1500	2000	1400	1500	1400	
Capacitance Across Open Contact	pF	1.50	0.70	1.50	0.70	1.50	0.70	1.50	0.90	0.80	1	
Switching Frequency	Hz	500	300	180	300	180	300	180	300	180	100	
Life Expectancy Signal Level IV-10mA	x10 ⁶ Operations	2 (@ 1000 Vdc-10mA)	500	1000	500	1000	500	1000	500	1000	1000	
Contact Material	Rh	Hg 16 mg	Hg 40 mg	Hg 40 mg	Hg 16 mg	Hg 40 mg	Hg 16 mg	Hg 40 mg	Hg 32 mg	Hg 80 mg	Hg 144mg	
Dielectric Strength Coil-Contact	VAC	1800	1000	4000	1000	4000	1000	4000	1000	1000	1000	
Insulation Resistance	Ohms	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	10 ¹¹ 10 ¹²	
Capacitance Open Contact to Coil	pF	3	1.20	3	1.20	3	1.20	3	1.80	2.20	1.20	
Operate or Pull in Time Incl. Bounce	ms	0.25 0.50	1.20 1.75	1.50 2.50	1.20 1.75	1.50 2.50	1.20 1.75	1.50 2.50	1.20 1.75	1.50 2.50	2.50 5.00	
Release or Drop Out Time With Diode	ms	0.25 0.50	1 1.50	1 2.50	1 1.50	1 2.50	1 1.50	1 2.50	1 1.70	1 2.50	1.70 5.00	
Operating Temperature	°C	-40 85	-35 75	-35 75	-35 75	-35 75	-35 75	-35 75	-35 75	-35 75	-35 75	
Storage Temperature	°C	-40 125	-40 105	-40 105	-40 105	-40 105	-40 105	-40 105	-40 105	-40 105	-40 105	
Shock Resistance	g	100	30	30	30	30	30	30	30	30	30	
Vibration Resistance	g	20	10	10	10	10	10	10	10	10	10	
Soldering Temp. 10 sec.	°C	260	260	260	260	260	260	260	260	260	260	
Weight (approx.)	grams	2	2.40	2.40	2.40	2.40	2.40	2.40	3.40	3.40	3.40	
Dimensions	Package Style	Package Style 6	Package Style 7	Package Style 7	Package Style 8	Package Style 8	Package Style 3	Package Style 9	Package Style 9	Package Style 10	Package Style 11	
Pin Configuration (top view)												

GENERAL PARAMETERS

Life expectancy
The life expectancy of a reed relay is at least 105...106 operations at nominal load. At minimum load the life expectancy can be up to 5x108 operations. The mechanical life expectancy is 109 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.

Inductive loads:
Contact arcing can occur while breaking an inductive load (back EMF). This arcing can damage the contact. Contact protection is advised in such cases by using a RC-snubber, MOV or transient voltage suppression diode.

Capacitive loads:
By switching a capacitive load (capacitors or long cables) the surge current may exceed the contact rating. These inrush currents should be limited by series resistors.

Lamp loads:
By switching on lamps the inrush current can be as high as 10 times the steady state current. This current must be limited with a series resistor within the allowed contact rating.

Thermoelectric voltage
Between FeNi (reed switch) and Cu (PCB) a thermoelectric voltage Uth = k x (T1-T2) occurs with the constant k = 50 µV/°C (T=temperature).

Thermal resistance of the DIL-SIL reed relays : 70 K/W.

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

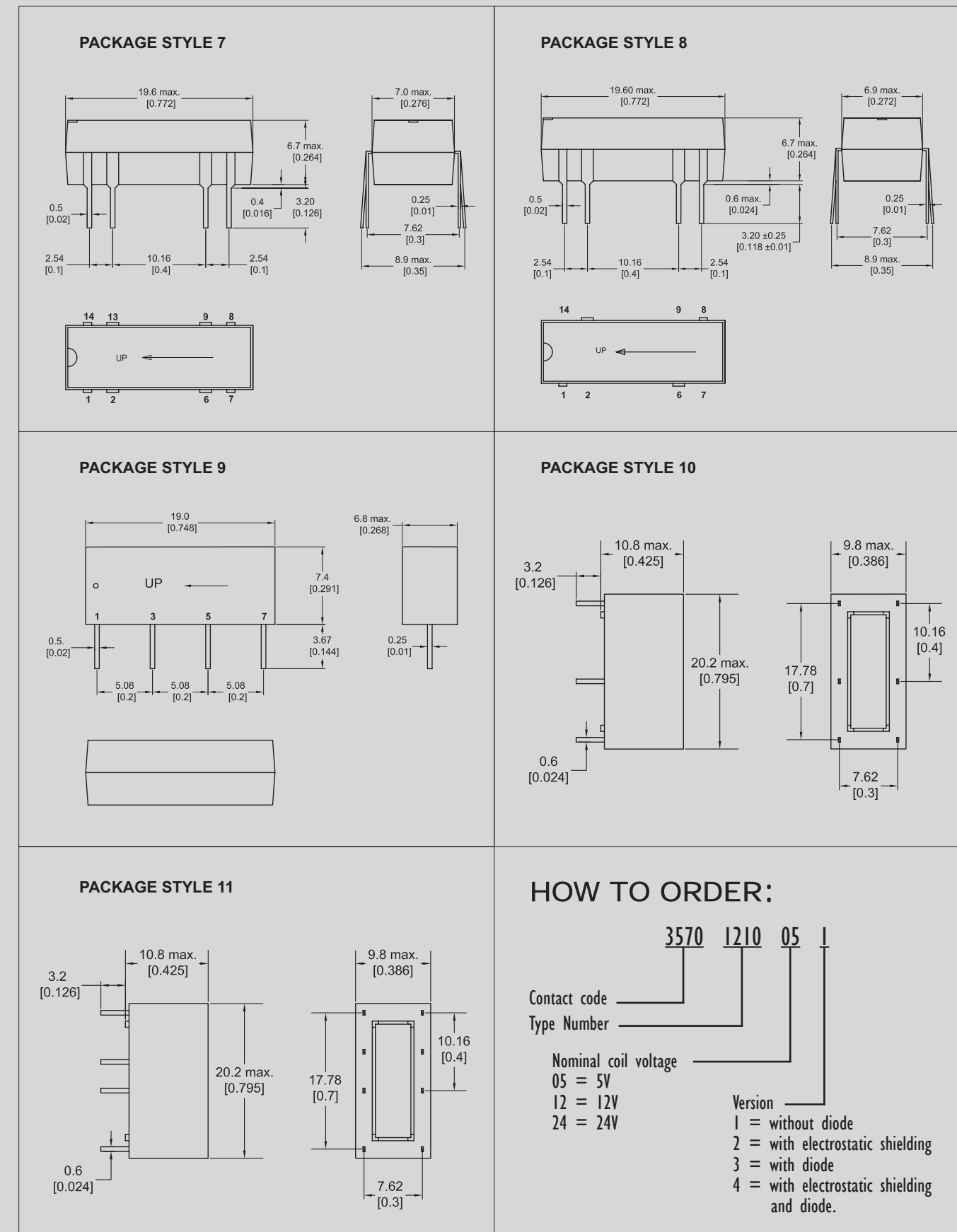
Solderability
All relays meet the DIN 8505 requirements. Hole diameter in PCB : 0.65 mm.

Switching time
When using dry reed switches in relays, contact bounce may occur.
Pull-in or operate time (incl. Bounce time) typ. 0.5 ... 1.8 ms at nominal voltage and 20 Hz.
Drop-out or release time (with diode suppression) typ. 0.5...1.5 ms at nominal voltage and 20 Hz.

Temperature Range
The operating temperature of the relay is the equivalent of the internal temperature. If the relays are used in ambient temperatures higher than 20°C, the maximum permissible operating voltage (UT) must be calculated according to the table indicated below, using the formula :
UT = Umax x k1
(Umax = max. permissible operating voltage)

T (°C)	20	30	40	50	60	70
k1	1.00	0.96	0.92	0.88	0.84	0.80

REED RELAY DIMENSIONS



The Comus International group of companies consists of:

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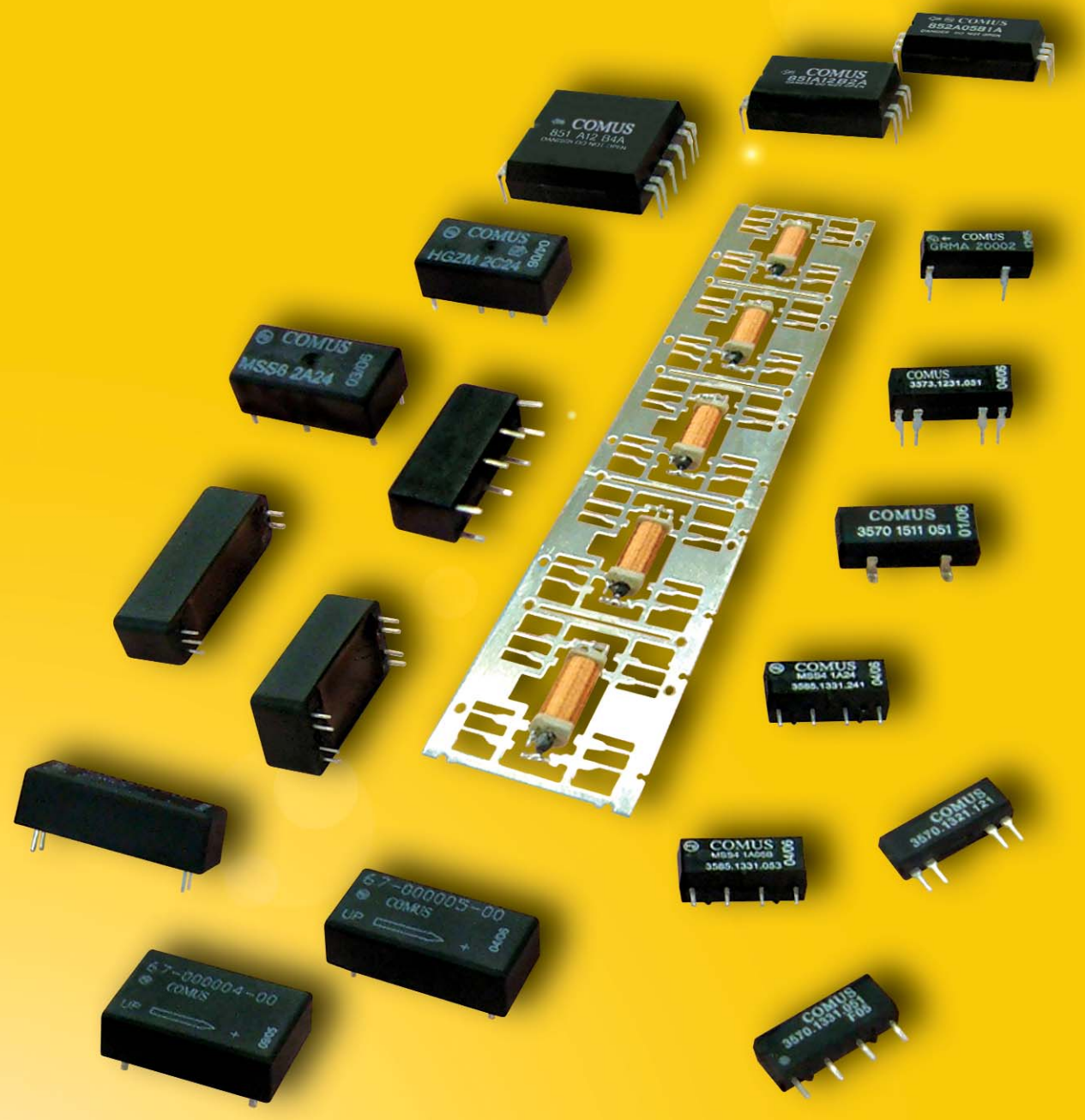
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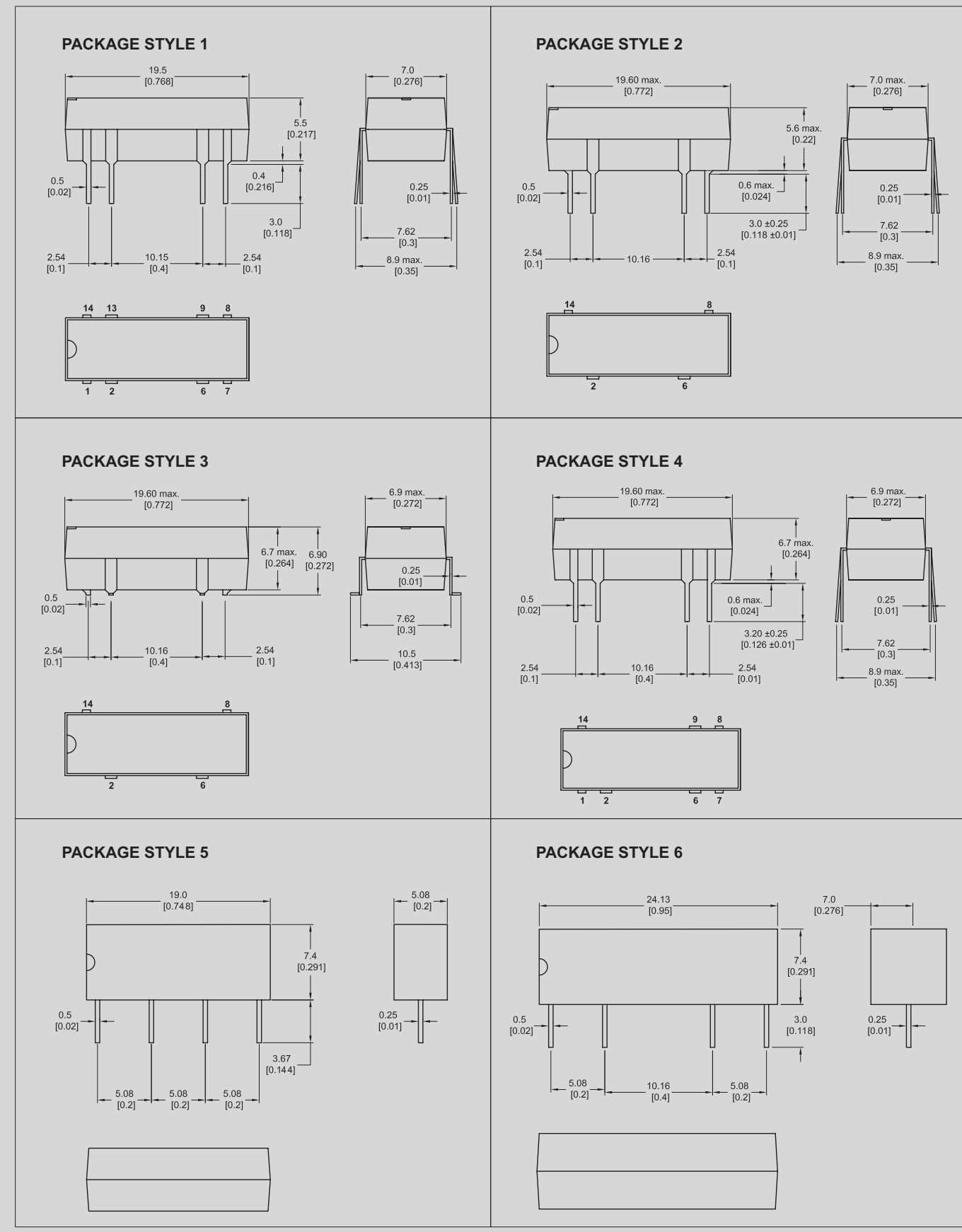
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We also have a large network of worldwide agents. These can be seen on any of our websites, or on our company profile brochure.

Dip and Sil Reed Relays



REED RELAY DIMENSIONS



All dimensions are nominal, in millimetres [inches] unless otherwise stated. If further information is required, individual datasheets are available on our websites, and on CD. As part of the group's 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.

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