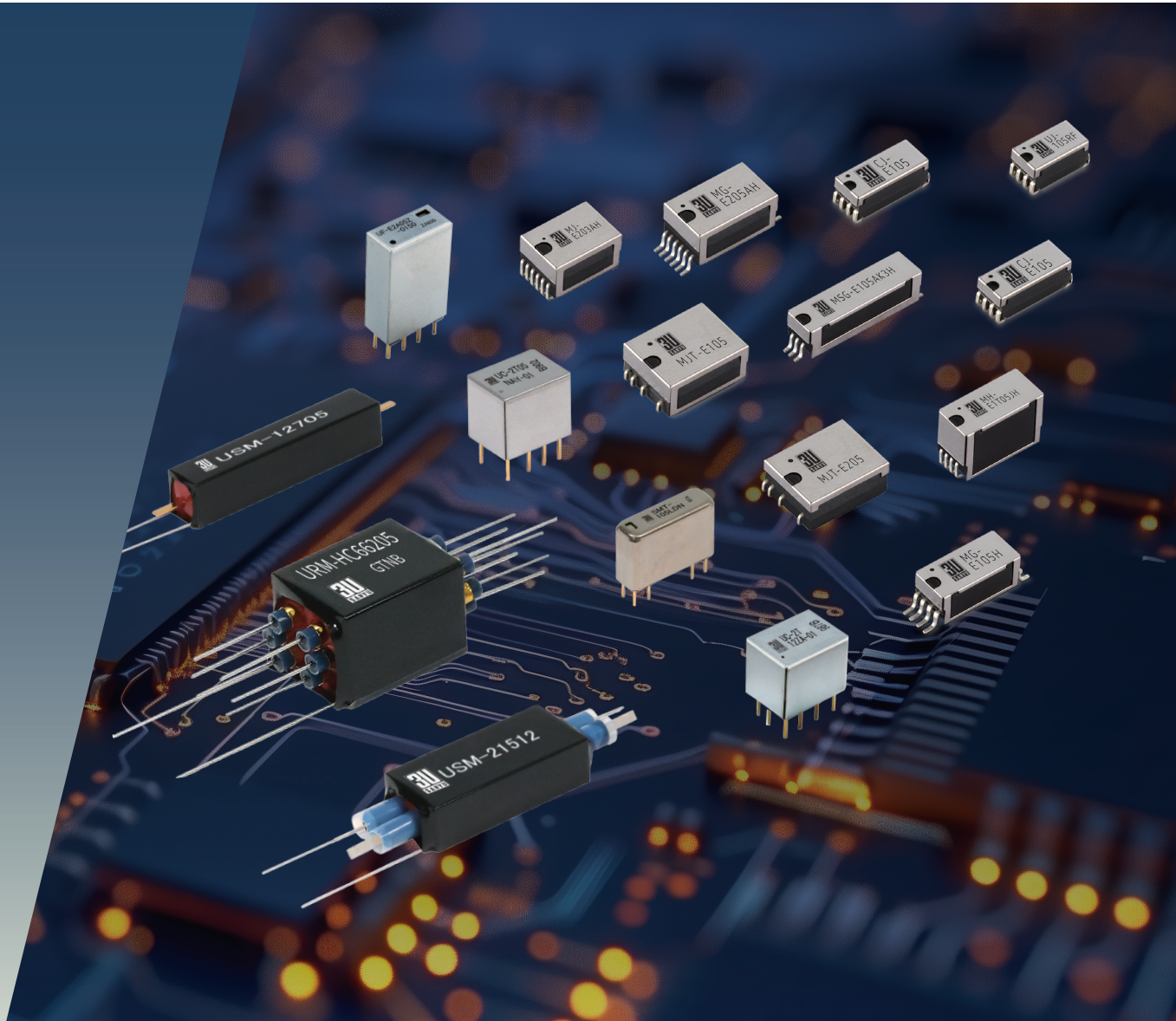


Sanyu Reed Relays

Product Line Brochure



Customer-Centric T&M Innovation: Standex Electronics Acquires Sanyu Switch

On Feb. 20, 2024, Standex acquired Sanyu Switch Co., Ltd., a Japanese company specializing in reed relays for automated test equipment (ATE) and high-frequency applications. This partnership brings together the strengths of both companies, further enhancing Standex's capabilities.

The acquisition of Sanyu Switch by Standex Electronics brings several benefits to our customers:

- **Enhanced Product Performance:** Efficient, reliable products with improved miniaturization and high-frequency capabilities.
- **Broader Solutions:** Wider range of advanced ATE and high-frequency applications.
- **Customization:** Tailored solutions to meet specific needs.
- **Innovation:** Cutting-edge technology and ongoing advancements.

Overall, customers can expect higher quality, more reliable, and innovative solutions from Standex Electronics.

Standex Electronics is a trusted and innovative leader in the T&M market. Their dedication to customer satisfaction, global presence, engineering expertise, and ongoing innovation enables them to deliver high-quality, reliable, and customized reed relay solutions tailored to the specific needs of various T&M applications.

SANYU REED RELAYS

A Standex Detect Product Brand



PRECISION SWITCHING BACKED BY A GLOBAL CENTER OF EXCELLENCE

Legacy Reed Relay Expertise

Decades of precision reed relay engineering developed as a dedicated brand within Standex Detect.

End-to-End OEM Control

Reed switch design, relay assembly, tooling, and testing fully integrated within the Standex Detect Center of Excellence.

Global Manufacturing Strength

Backed by Standex Electronics with consistent quality systems and a global footprint.

ENGINEERED VALUE

- Faster development & qualification cycles
- Long-term lifecycle and supply stability
- Repeatable global quality
- Controlled performance from switch to relay

Sanyu Reed Relays are part of the Standex Detect family of engineered switching solutions bringing together decades of reed relay expertise with the scale, quality, and OEM manufacturing control of Standex Electronics. As one of Standex Detect's legacy engineering brands, Sanyu represents a deep heritage of precision reed relay design unified under a single global platform for manufacturing, qualification, and testing.

All Sanyu products are backed by Standex Detect's rigorous quality systems and operate under the strategic leadership and governance of Standex Electronics and Standex International Corporation (NYSE: SXI).

Table of Contents

High Current	06
High Voltage	12
Compact High Voltage	20
High Voltage / High Insulation	24
High Insulation (Dual Shield)	26
High Temperature Resistance up to 155°C	32
High Temperature Resistance up to 125°C	34
High Temperature Resistance up to 105°C	38
Compact Mount: Switching Voltage 100 VDC	42
Compact Mount: Switching Voltage 200 VDC	48
Compact Mount: High Density	60
Compact Mount: Double Coil	68
Surface Mount: RF DC-8.0 GHz	72
Surface Mount: RF DC-7.0 GHz	74
Surface Mount: RF DC-6.0 GHz	76
Surface Mount: RF DC-4.0 GHz	78
Surface Mount: RF DC-2.5 GHz	82
Surface Mount: RF DC-3.5 GHz	84
Surface Mount: RF DC-4.0 GHz	88
Tape and Reel	90
Overview of Reed Relays	92

Features				Shape	Contact Configurations	Contact Rating	Shield	Model	Page		
High Current	Carry current	13A	Axial	1 Form A	60W	○	USM-128xxGSN-02B	6			
	6 Form A in parallel	25A		6 Form A	100W		URM-HC662xxGTNB	8			
	Carry current	5A		1 Form A			URM-36324D-60	10			
High Voltage	5KV		Axial	1 Form A	50W	-	USM-115xx	12			
				2 Form A			USM-215xx	14			
	10KV		PCB	1 Form A			UPM-136xxSV	16			
	15KV		Axial				USM-136xxSB	18			
							USM-140xxSB-15				
Compact High Voltage	2.5KV		Compact PCB	1 Form A	100W	-	UPM-162xxYHL	20			
	2.0KV						SL-162xx	22			
High Voltage / High Insulation	2.5KV	10 ¹³ Ω	Compact Axial	1 Form A	100W	○	URM-162xxGTNB	24			
		10 ¹⁴ Ω					URM-162xxGTOB				
High Insulation (Dual Shield)	Between Contacts	10 ¹³ Ω	PCB & Axial	1 Form A	50W	○	URM-P129xxGTNE	26			
		10 ¹⁴ Ω		URM-P129xxGTOE							
		10 ¹³ Ω		2 Form A			URM-P229xxGTNE	28			
		10 ¹⁴ Ω		URM-P229xxGTOE							
		10 ¹³ Ω		3 Form A			URM-P329xxGTNE	30			
		10 ¹⁴ Ω					URM-P329xxGTOE				
High Temperature Resistance	Operate temp : -20°C to +155°C		Ultra-Compact PCB	1 Form A	10W	-	MFS-E1xxN-53	32			
						○	MFS-E1xxG-53				
	Operate temp : -20°C to +125°C		Compact Vertical PCB	2 From A		UF-E2AxxZ-0150	34				
				1 From C(A+B)		UF-E1TxxZ-0150	36				
	Operate temp : -20°C to +105°C		Ultra-Compact PCB	2 From C(A+B)		-	UC-2TxxNA-015A	38			
			4 From A	UC-2TxxNAY-015A							
Compact Mount	Switching Voltage : 100VDC	4.9mm x 4.9mm	with LED	Ultra-Compact Vertical PCB	1 Form A	10W	○	FS-E1Axx	42		
		7.62mm x 4.9mm		2 Form A	-		FS-E2Axx	44			
				1 Form C(A+B)	○		FS-E1Txx	46			
	Switching Voltage : 200VDC	10.16mm x 5.08mm	with LED	Compact Vertical PCB	1 Form A	10W	○	UF-1Axx	48		
				2 Form A	○		UF-2Axx	50			
				1 Form C(A+B)			UF-1Txx	52			
		15.24mm x 5.08mm		Compact PCB	1 Form A		10W	○	SMT-1AxxLDN	54	
		2 Form A	SMT-2AxxLDN	56							
		1 Form C(A+B)	SMT-1xxLDN	58							
	High Density	3.9mm x 3.9mm		Ultra-Compact PCB	1 Form A	30W	-	FL-E1AxxN	60		
		6.9mm x 4.9mm			2 Form A			FC-E2AxxN	62		
					2 Form C(A+B)			10W	○	UC-2TxxNA-01	64
		10.16mm x 7.62mm							UC-2TxxNAY-01		
	Double Coil	12.7mm x 5.08mm		Compact PCB	2 Form A(2-2)	10W	○	UC-2T12Z-01	66		
		17.78mm x 5.08mm						UC-2T12ZA-01			
	Surface Mount	RF: DC-8.0GHz	7.95mm x 4.76mm	J-lead	Ultra-Compact SMT	1 Form A	3W	○	UJ-1xxRF	72	
RF: DC-7.0GHz		9.1mm x 4.67mm	CJ-E1xxRF						74		
RF: DC-6.0GHz			Gull wing	Compact SMT	1 Form A	10W	MG-E105H-64	76			
RF: DC-4.0GHz		12.7mm x 4.67mm					MG-E1xxH	78			
		10.16mm x 4.67mm	J-lead	SMT	1 Form A	30W	MJ-E1xxH	80			
RF: DC-2.5GHz		20.4mm x 4.5mm	Gull wing				MSG-1xxAK3H	82			
RF: DC-3.5GHz		12.7mm x 7.62mm	Gull wing	Compact SMT	1 Form C(A+B)	10W	MGT-E1xxH	84			
		10.8mm x 7.62mm	J-lead				MJT-E1xxH	86			
RF: DC-4.0GHz		10.3mm x 11.3mm	J-lead				MJ-E2TxxN	88			
Tape and Reel									90		
Overview of Reed Relays									92		

USM-1A: High Carry Current Axial Relay



This product achieves a high carry current in a small package. In controlling high currents, this product offers overwhelming superiority in electrical lifespan and rated current.

It is effective as a contact point in power device and power module testing.

Characteristics

- Carry current: 13A
- Dielectric strength: 3000VDC
- Insulation resistance: $\geq 10^{13}\Omega$

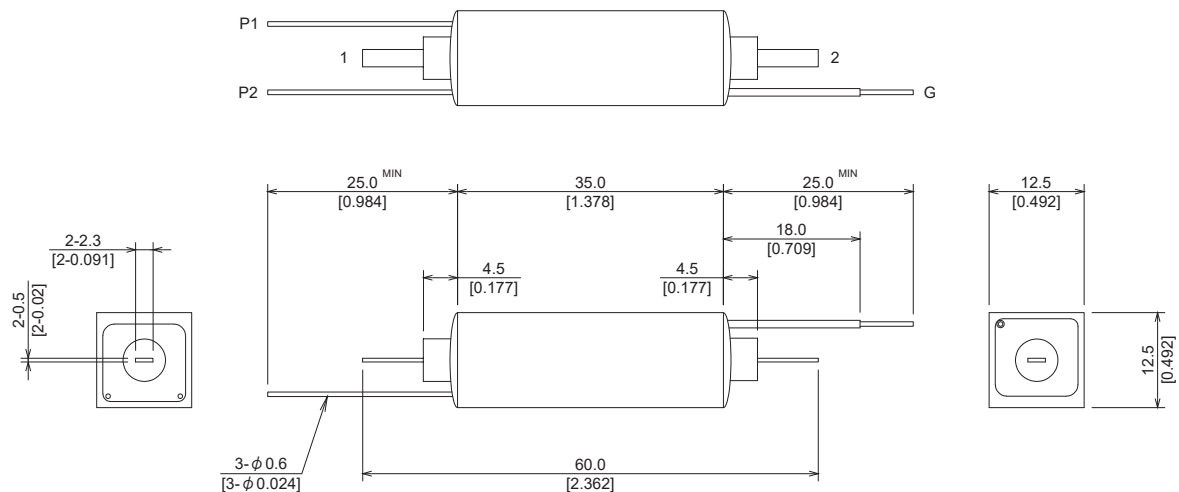


USM 1A Series		USM-12805GSN-02B			USM-12812GSN-02B			USM-12824GSN-02B			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage	±10% @20°C @20°C @20°C		5.0			12.0			24.0		VDC
Coil Resistance			30			160			550		Ω
Must Operate				3.75			8.8			17.6	VDC
Must Release			0.5		1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								1000	V
Switching Current		DC/Peak AC resistance								1.0	A
Carry Current		DC/Peak AC resistance(@30°C)								13.0	A
Contact Rating		DC/Peak AC resistance								60	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								250	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								10	mΩ
Insulation Resistance		Between Contacts						10 ¹³			Ω
		Contacts to Shield						10 ¹³			Ω
		Contacts to Coil						10 ¹³			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						3000			VDC
(Static)		Contacts to Shield						3000			VDC
		Contacts to Coil						3000			VDC
		Shield to Coil						1000			VDC
Operate Time		at Nominal Coil Voltage								4.0	msec
(Including Bounce)		50Hz Square Wave									
Release Time		Diode Suppression								4.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

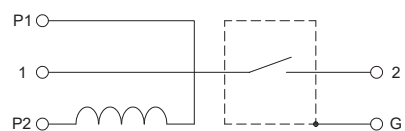
※ This product was developed to achieve high carry current and, as such, contact resistance may be unstable at small currents (100mA or less).

※ Contact breakdown voltage: With Terminal 1 (-), Terminal 2 (+) polarities

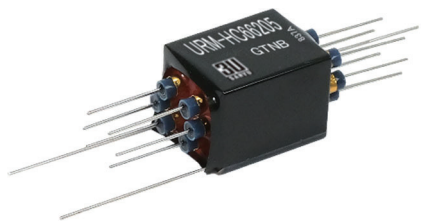
Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



URM-6A: Parallel High Carry Current Axial Relay



This product offers 6 Form A contacts in a small 29.0mm x 19.5mm x 15.5mm package. Having 6 Form A contacts in parallel allows for pulsed currents up to 25.0A. The product also achieves operating and recovery times of 1.5ms.

Characteristics

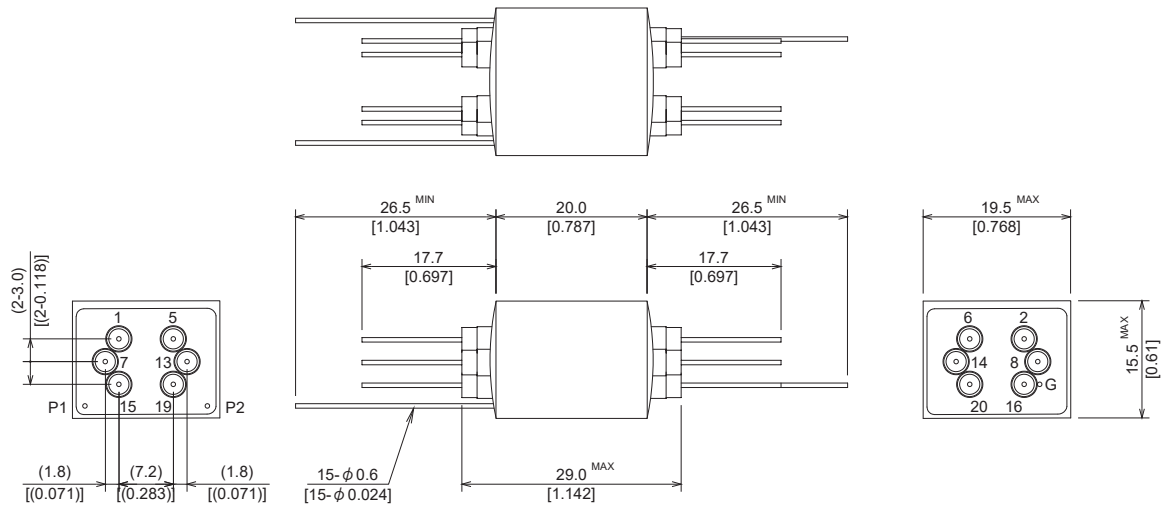
- Dielectric strength: 2500VDC
- Insulation resistance: $\geq 10^{13}\Omega$
- 6 Form A in parallel: Maximum 25.0A (1ms ON/99ms OFF) at 30°C



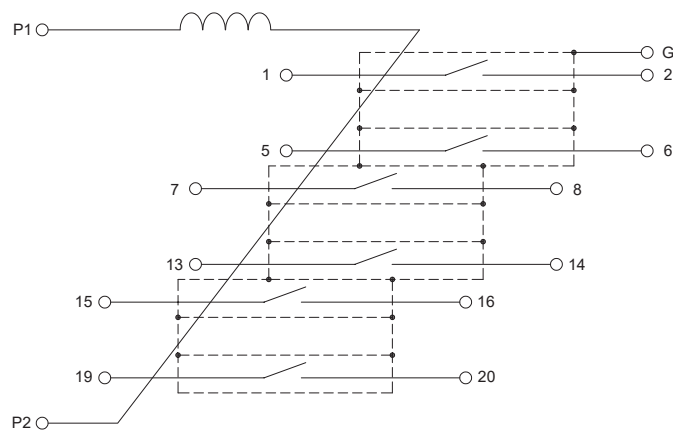
URM 6A Series		URM-HC66205GTNB			URM-HC66212GTNB			URM-HC66224GTNB			
Contact Form		6 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		70			400			1600		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								*1	V
Switching Current		DC/Peak AC resistance								1.0	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								100	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹³			Ω
		Contacts to Shield						10 ¹³			Ω
		Contacts to Coil						10 ¹³			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						2500			VDC
(Static)		Contacts to Shield						2500			VDC
		Contacts to Coil						2500			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								1.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

*1 Switching voltage: 1000V (maximum 1mA)

Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



NEW

USM-1A: High Carry Current Axial Relay



Achieves a contact resistance of 60mΩ or less in 3 Form A parallel configuration, with a contact rating of 100W, dielectric strength of 2000VDC, and carry current of 5A.

It is effective as a contact in power device and power module measurement applications.

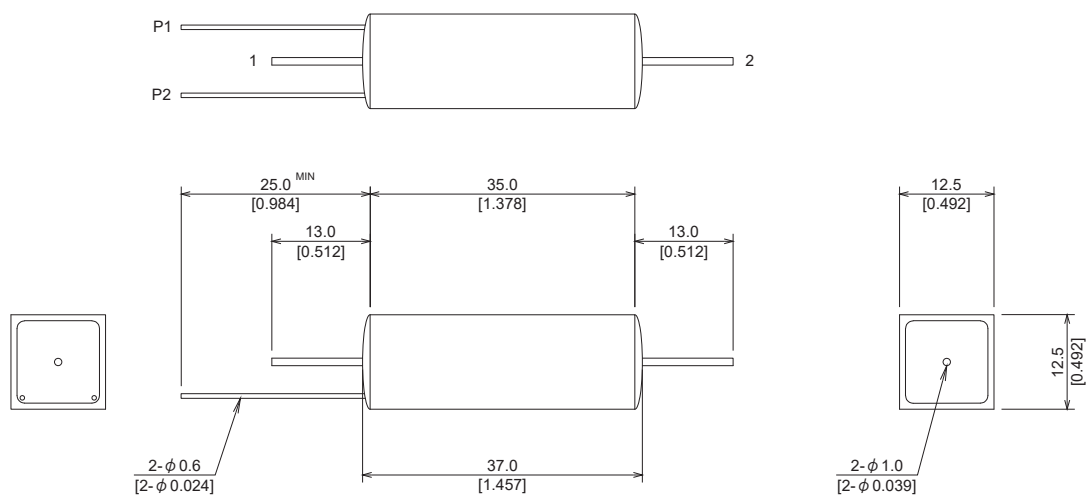
Characteristics

- Contact Resistance: $\leq 60\text{m}\Omega$
- Dielectric strength: 2000VDC
- Maximum switching voltage: 1500VDC

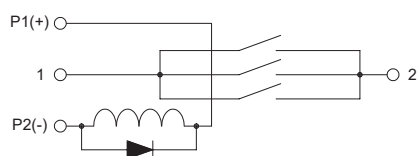


USM 1A Series		USM-36324D-60					
Contact Form		1 Form A					
Coil Specifications							
Parameters	Conditions	Min	Nom	Max	Units		
Coil Voltage			24.0		VDC		
Coil Resistance	±10% @20°C		1500		Ω		
Must Operate	@20°C			17.6	VDC		
Must Release	@20°C	2.4			VDC		
Contact Ratings / Product Specifications							
Test Parameters		Test Conditions		Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance				1500	V
Switching Current		DC/Peak AC resistance				1.5	A
Carry Current		DC/Peak AC resistance(@30°C)				5.0	A
Contact Rating		DC/Peak AC resistance				100	W
Life Expectancy		at 1V 10mA		100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage				60	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage				5	mΩ
Insulation Resistance		Between Contacts		10 ¹²			Ω
		Contacts to Shield					Ω
		Contacts to Coil		10 ¹⁰			Ω
		Shield to Coil (at 100V 20°C 65%)					Ω
Dielectric Strength		Between Contacts		2000			VDC
(Static)		Contacts to Shield					VDC
		Contacts to Coil		2000			VDC
		Shield to Coil					VDC
Operate Time		at Nominal Coil Voltage				2.0	msec
(Including Bounce)		100Hz Square Wave					
Release Time		Diode Suppression				2.0	msec
Measurement Reference Condition			Environmental Ratings				
Temp : 15°C to 35°C			Operate temp : -20°C to +80°C				
Humidity : 25% to 75%RH			Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa			Vibration : 20G's to 2000Hz				
			Shock : 50G's				

Dimensions < All Dimensions are mm [inch] >

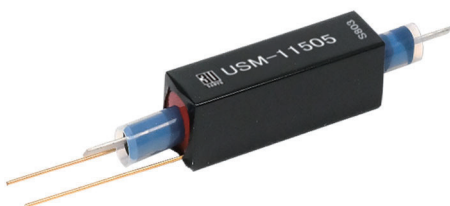


Schematic <Top View>



* Coil polarities, (+) and (-).

USM-1A: High Voltage 5000VDC Axial Relay



This product is our popular high voltage axial reed relay in a 1 Form A contact configuration. In response to market demands, this product guarantees a dielectric strength of 5000VDC between conductors.

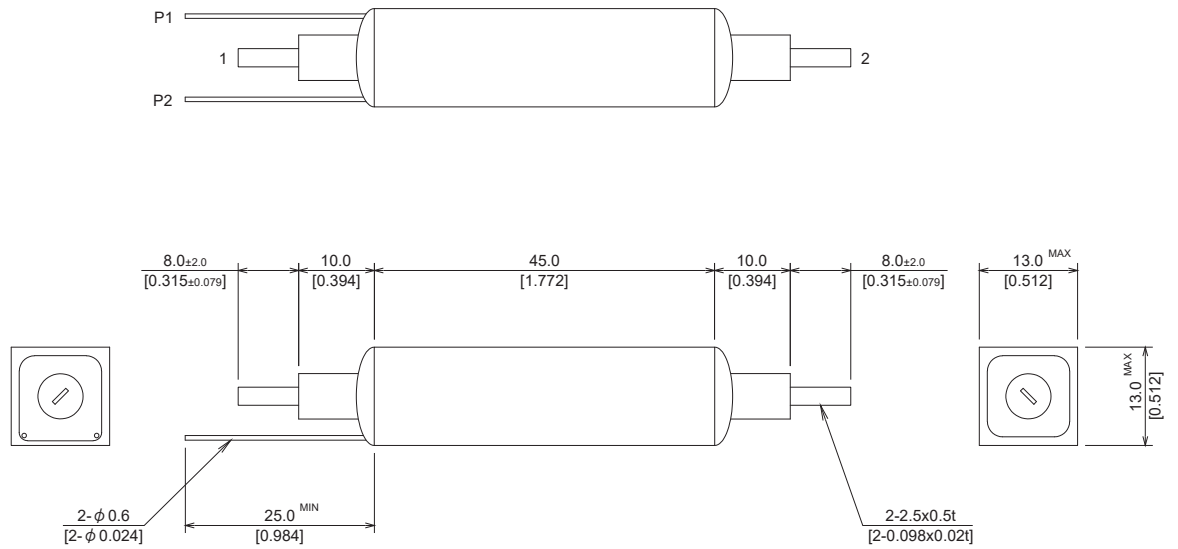
Characteristics

- Maximum contact rating: 50W
- Maximum switching voltage: 3500VDC
- Dielectric strength: 5000VDC

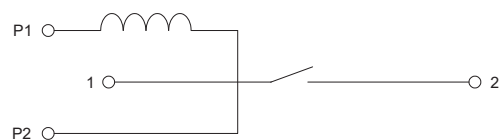


USM 1A Series		USM-11505			USM-11512			USM-11524			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage	±10% @20°C @20°C @20°C @20°C		5.0			12.0			24.0		VDC
Coil Resistance			60			200			800		Ω
Must Operate				3.75			8.8			17.6	VDC
Must Release		0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								3500	V
Switching Current		DC/Peak AC resistance								3.0	A
Carry Current		DC/Peak AC resistance(@30°C)								4.0	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								200	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								20	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						5000			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						5000			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								4.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								3.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



USM-2A: High Voltage 5000VDC Axial Relay



This product is our popular high voltage axial reed relay in a 2 Form A contact configuration. In response to market demands, this product guarantees a dielectric strength of 5000VDC between conductors.

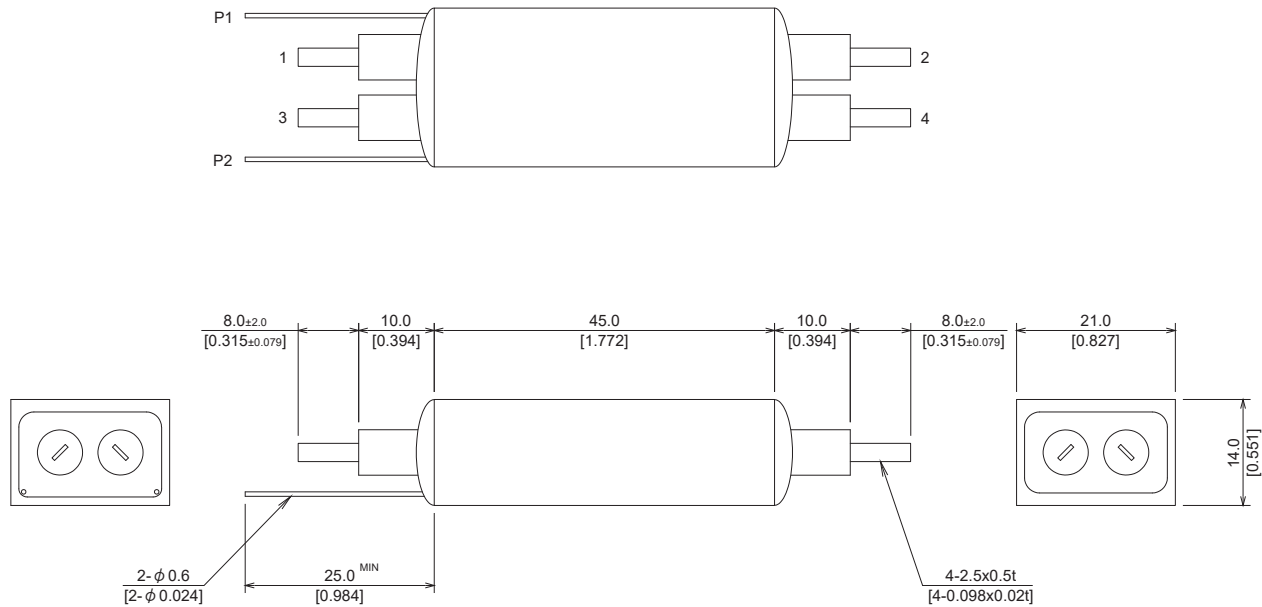
Characteristics

- Maximum contact rating: 50W
- Maximum switching voltage: 3500VDC
- Dielectric strength: 5000VDC

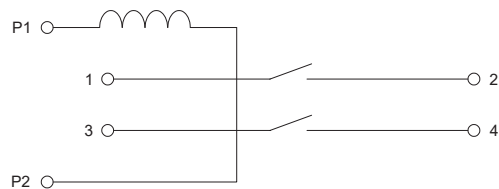


USM 2A Series		USM-21505			USM-21512			USM-21524			
Contact Form		2 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		45			160			600		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.5			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								3500	V
Switching Current		DC/Peak AC resistance								3.0	A
Carry Current		DC/Peak AC resistance(@30°C)								4.0	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								200	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								20	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						5000			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						5000			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								4.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								3.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

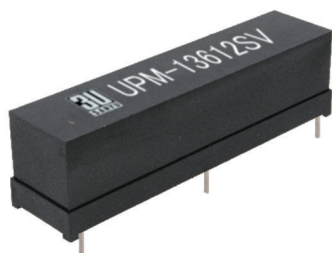
Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



UPM-1A: High Voltage 10000VDC PCB Relay



This product is for PCB mounting, with a guaranteed dielectric strength of 10000VDC between each conductor. Using a resin casing provides improved safety and ease in manufacturing for customers when mounted on a PCB.

Characteristics

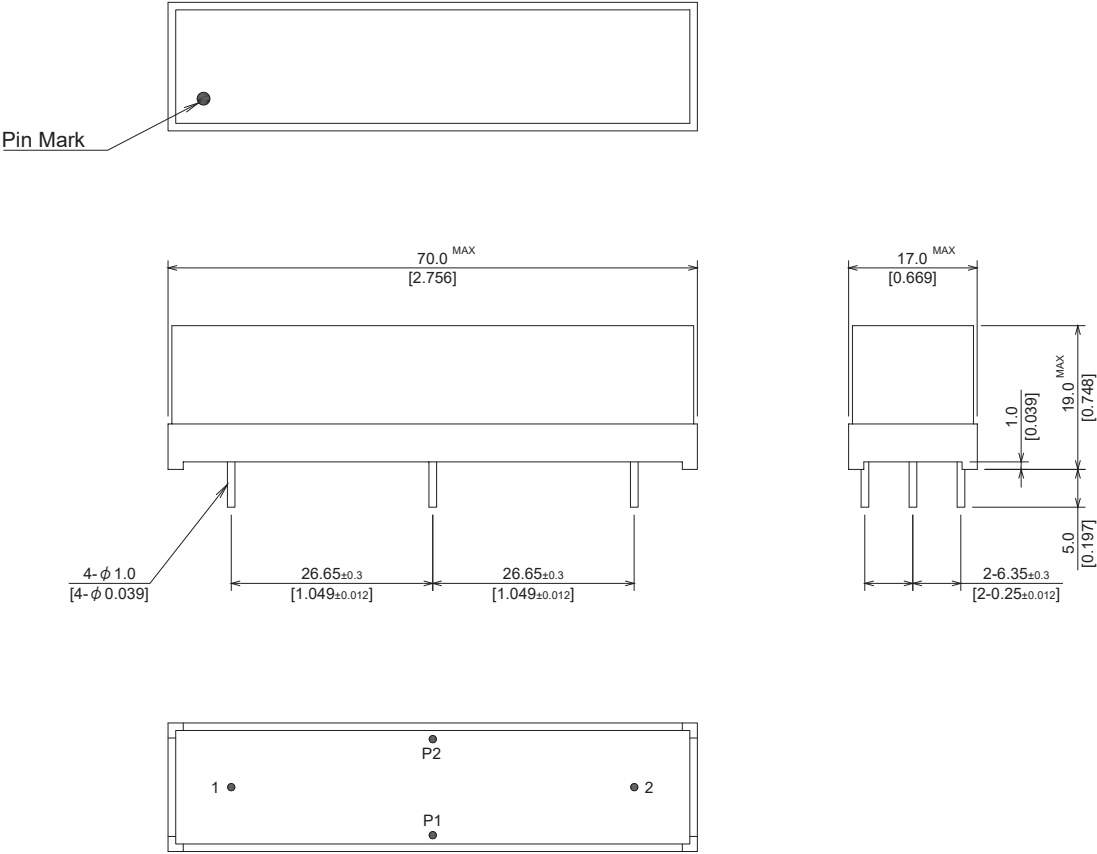
- Maximum contact rating: 50W
- Maximum switching voltage: 7500VDC
- Dielectric strength: 10000VDC



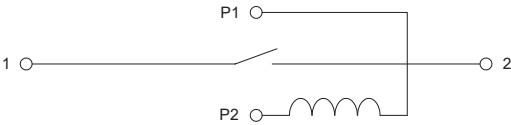
UPM 1A Series		UPM-13605SV			UPM-13612SV			UPM-13624SV			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		35			180			650		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								7500	V
Switching Current		DC/Peak AC resistance								3.0	A
Carry Current		DC/Peak AC resistance(@30°C)								4.0	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								500	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage									mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						10000			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						10000			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								5.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								5.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

Dimensions < All Dimensions are mm [inch] >

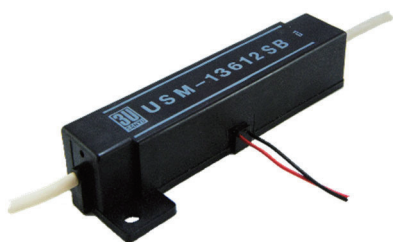
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



USM-1A: High Voltage (10000VDC/15000VDC) Axial Relay



This series features dielectric strength between conductors of 10000/15000V DC, maximum contact capacity of 50W, and maximum switching voltages of 7500/10000VDC.

We use high-voltage cables and a resin case to improve implementability and safety. USM-140xxSB-15 is the successor to USM-139xxSB.

Characteristics

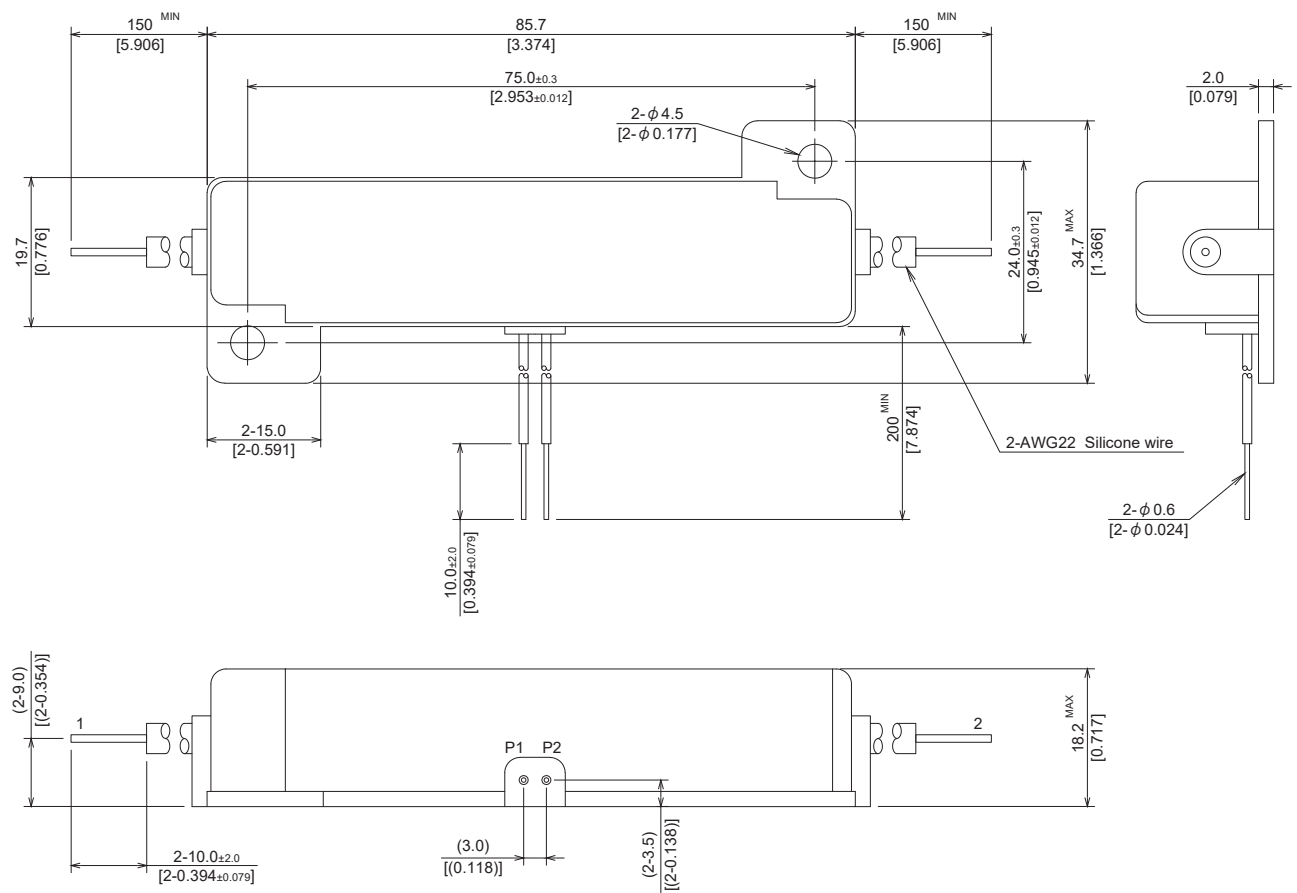
- Maximum contact rating: 50W
- Maximum switching voltage:
USM-136xxSB / 7500VDC, USM-140xxSB-15 / 10000VDC
- Dielectric Strength:
USM-136xxSB / 10000VDC, USM-140xxSB-15 / 15000VDC



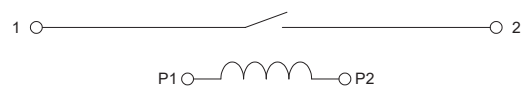
USM 1A Series		USM-13605SB USM-14005SB-15			USM-13612SB USM-14012SB-15			USM-13624SB USM-14024SB-15			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		*1			*2			*3		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								*4	V
Switching Current		DC/Peak AC resistance								3.0	A
Carry Current		DC/Peak AC resistance(@30°C)								4.0	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								500	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage									mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						*5			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						*5			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								5.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								5.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

	*1	*2	*3	*4	*5
★ USM-136xxSB	80 Ω	250 Ω	600 Ω	7500 V	10000 V
★ USM-140xxSB-15	30 Ω	120 Ω	400 Ω	10000 V	15000 V

Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



UPM-1A: High Voltage 2500VDC Compact PCB Relay



This product was developed to guarantee a dielectric strength of 3000VDC between conductors (2500VDC between contacts). The maximum contact capacity of 100W is among the highest in reed relays. The maximum switching voltage and current are comparable to those of mercury relays.

Characteristics

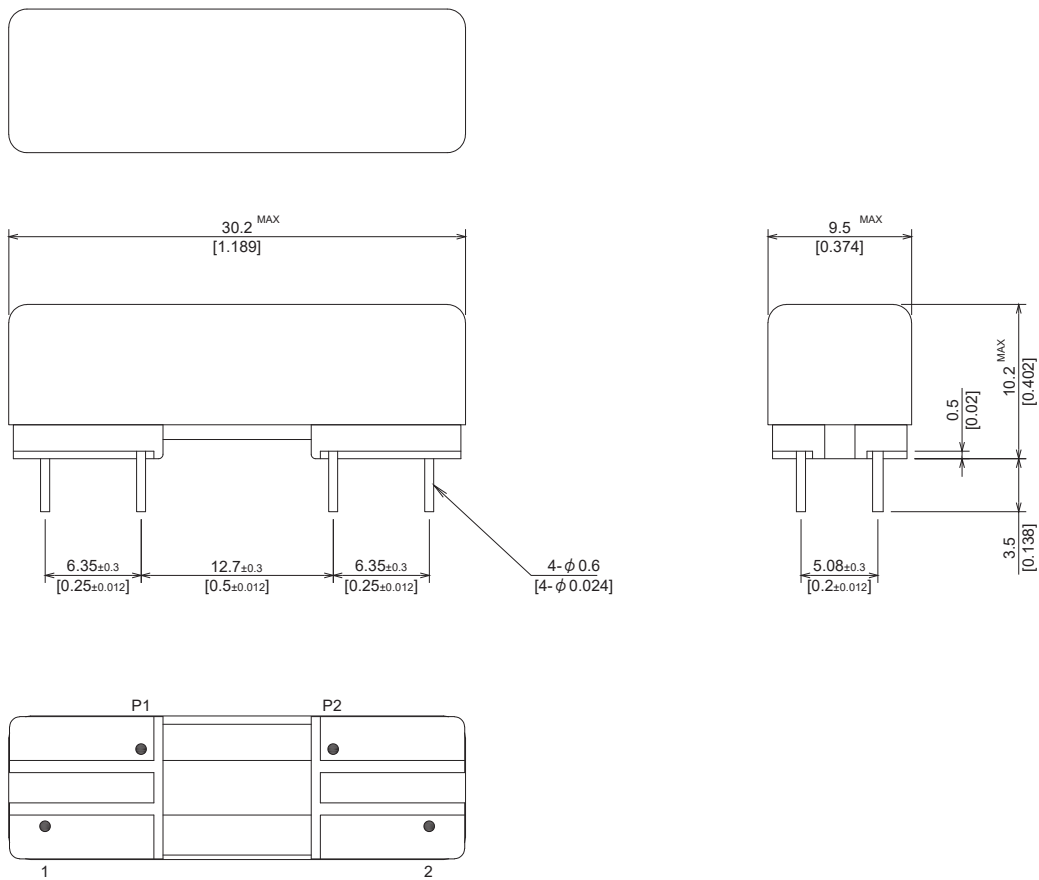
- Mount area: 30.2mm x 9.5mm
- Maximum contact rating: 100W
- Maximum switching voltage: 1000VDC
- Dielectric strength: 3000VDC (2500VDC between contacts)



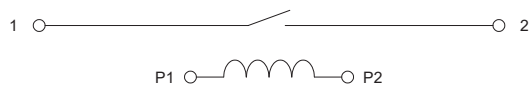
UPM 1A Series		UPM-16205YHL			UPM-16212YHL			UPM-16224YHL			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		120			600			1800		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								*1	V
Switching Current		DC/Peak AC resistance								1.0	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								100	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						2500			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						3000			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								1.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

*1 Switching voltage: 1000V (maximum 1mA)

Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



SL-1A:High Voltage 2000VDC Compact PCB Relay



This product is one of our smallest PCB reed relays developed to guarantee dielectric strength between conductors of 2000VDC. The maximum contact capacity of 100W is among the highest in reed relays. The maximum switching voltage and current are comparable to those of mercury relays.

- Characteristics
- Mount area: 35.5mm x 6.3mm
 - Max contact rating: 100W
 - Max switching voltage: 1000VDC
 - Dielectric strength: 2000VDC

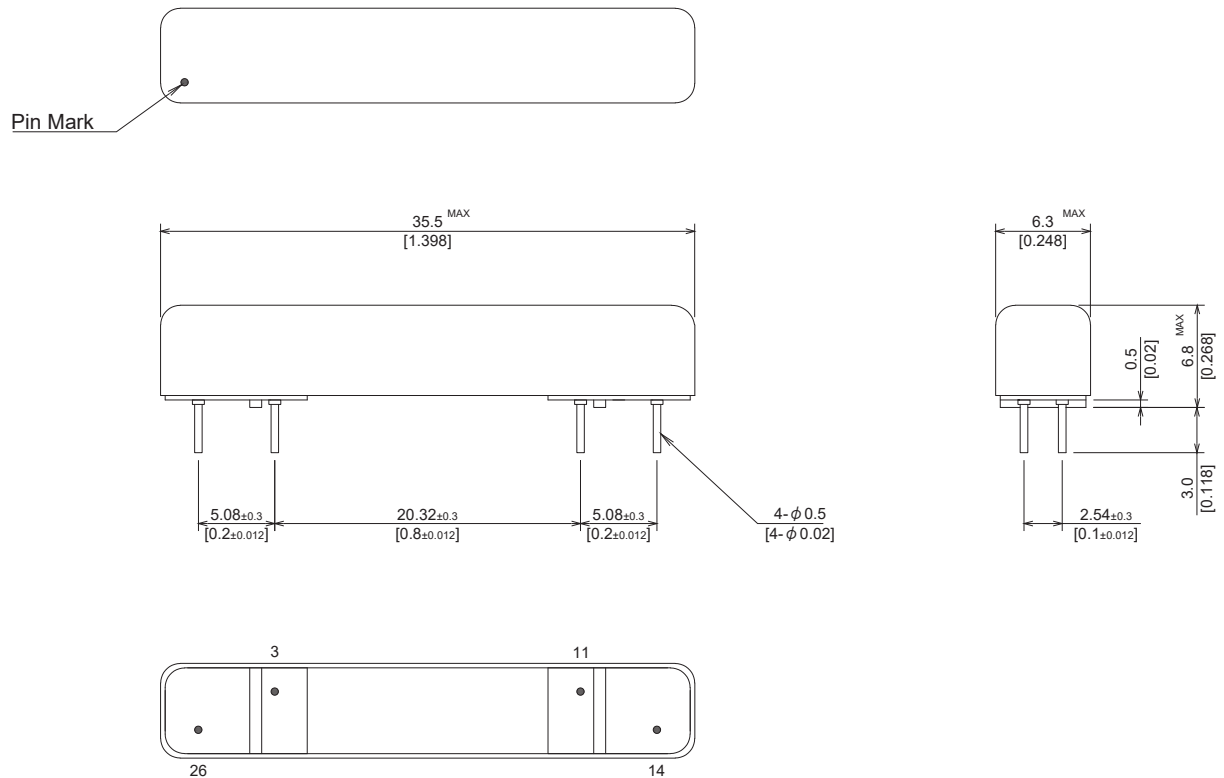


SL 1A Series		SL-16205			SL-16212			SL-16224			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		100			550			2000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								*1	V
Switching Current		DC/Peak AC resistance								1.0	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								100	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						2000			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						2000			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

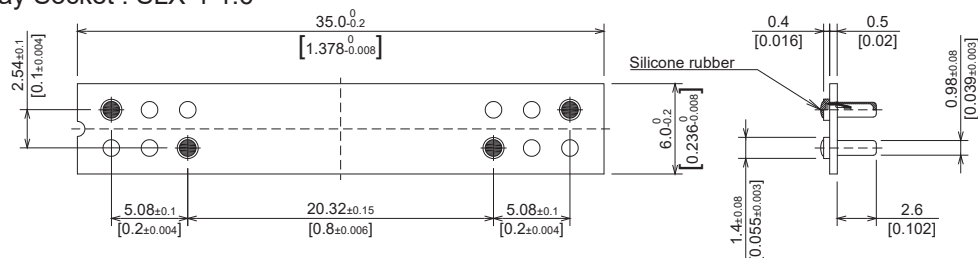
*1 Switching voltage: 1000V (Maximum 1mA)

Dimensions < All Dimensions are mm [inch] >

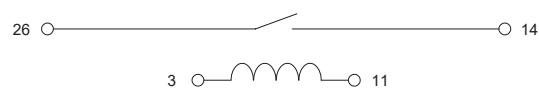
* Pin mark (●) corresponds to the terminal number 1.



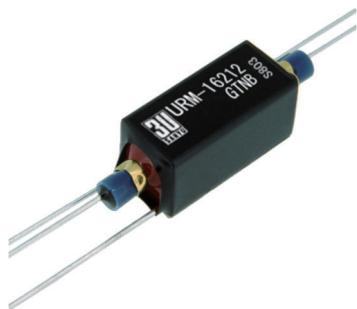
Relay Socket : SLX-4-1.6



Schematic <Top View>



URM-1A: High Voltage & Insulation Resistance Compact Axial Relay



This series of 1 Form A contact axial relays guarantees dielectric strength between contacts of 2500VDC and insulation resistance of at least $10^{13}\Omega$. The maximum contact capacity of 100W is among the highest in reed relays. The maximum switching voltage and current are comparable to those of mercury relays. Also, because the lead wire is flexible, they can be used in things like aerial wiring.

Characteristics

- Maximum contact rating: 100W
- Maximum switching voltage: 1000VDC
- Dielectric strength: 2500VDC
- Insulation resistance: $10^{13}\Omega$, $10^{14}\Omega$

GTNB offered in 2 Form A, 3 Form A, and 4 Form A options.
GTOB offered in 2 Form A option.

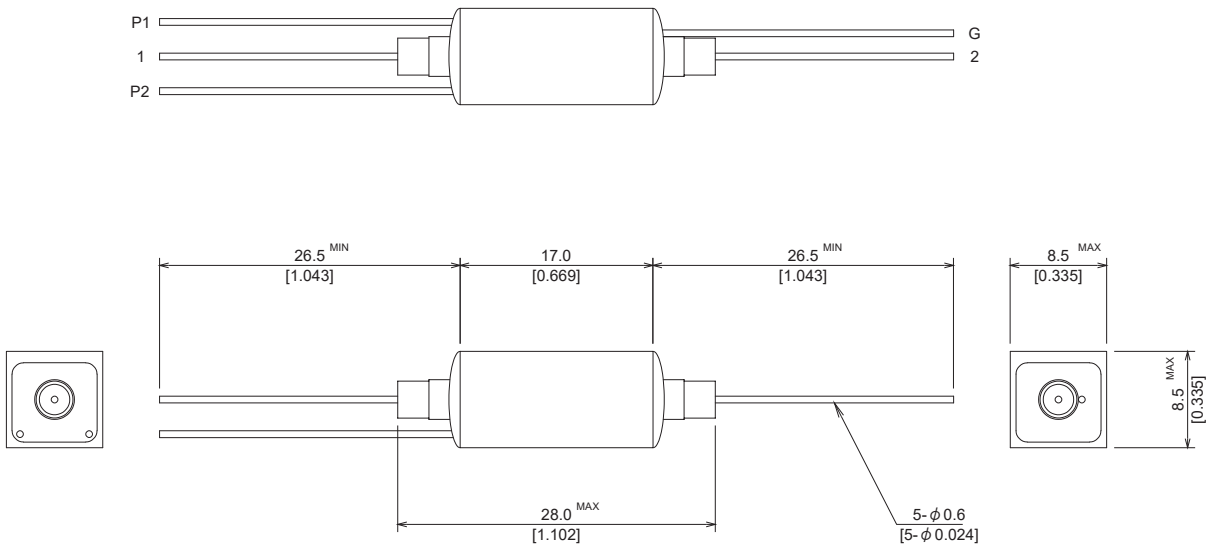


URM 1A Series		URM-16205GT□B			URM-16212GT□B			URM-16224GT□B			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		250			1000			4000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								*1	V
Switching Current		DC/Peak AC resistance								1.0	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								100	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						*2			Ω
		Contacts to Shield						*2			Ω
		Contacts to Coil						*2			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						2500			VDC
(Static)		Contacts to Shield						2500			VDC
		Contacts to Coil						2500			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

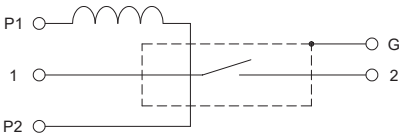
*1 Switching voltage: 1000V (maximum 1mA)

*2 GTNB : $10^{13}\Omega$ (□ : Insulation resistance classification)
GTOB : $10^{14}\Omega$

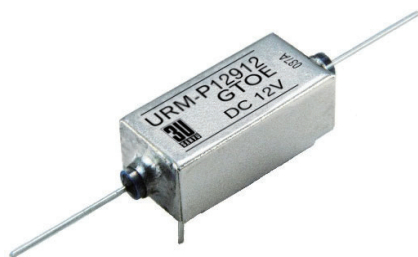
Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



URM-P1A: High Insulation PCB & Axial Relay



This series features a semi-tubular reed relay with a 1 Form A contact, incorporating dual shielding—electromagnetic and electrostatic—for superior performance. It is one of our flagship products, setting the standard in high-insulation applications.

Characteristics

- Insulation resistance: 1000VDC (500VDC between contacts)
- Insulation resistance: $\geq 10^{13}\Omega$
- Electrical lifespan: 1 billion (@ 1V 10mA)

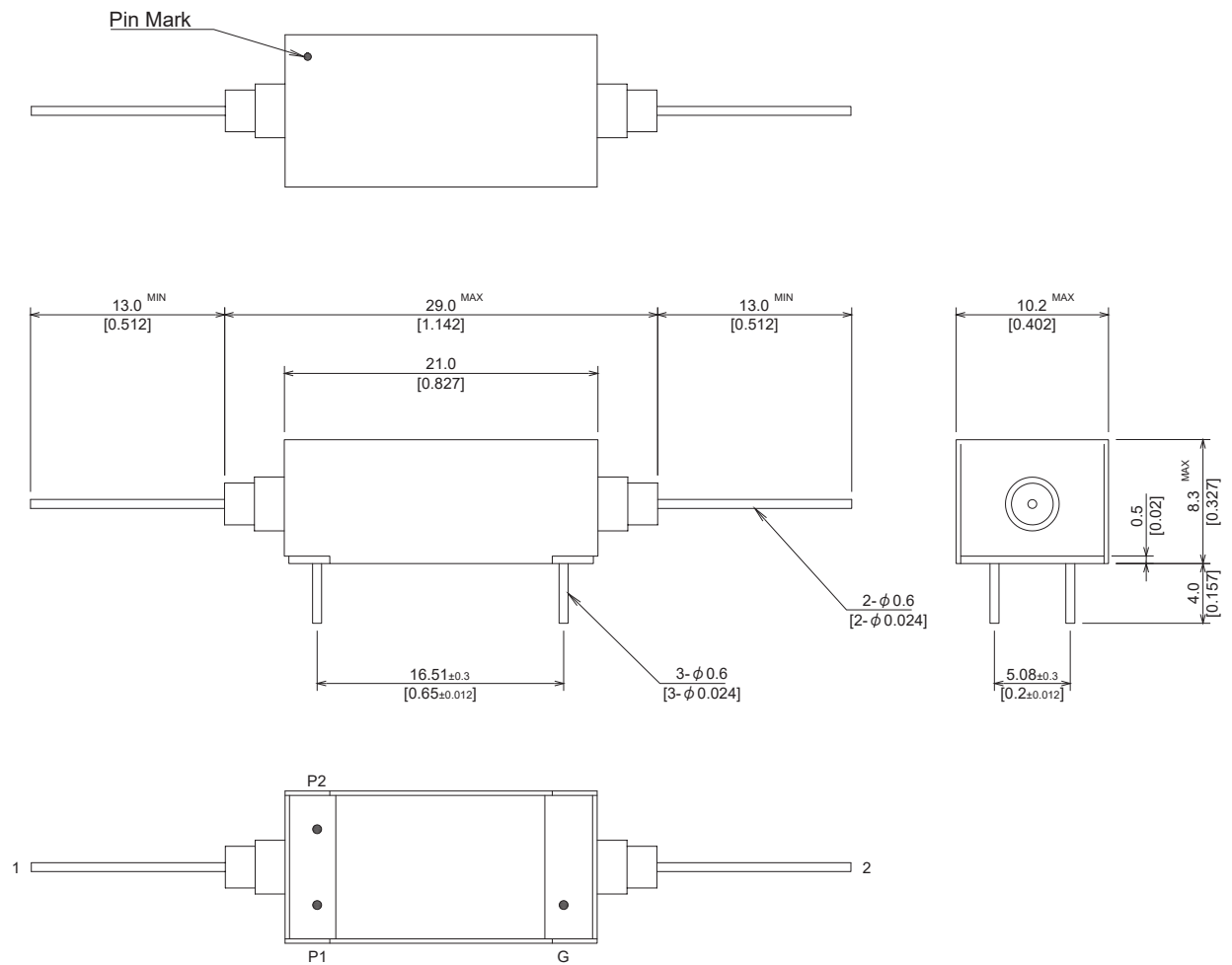


URM 1A Series		URM-P12905GT□E			URM-P12912GT□E			URM-P12924GT□E			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		450			2500			8000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								350	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						1000			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						*1			Ω
		Contacts to Shield						10 ¹³			Ω
		Contacts to Coil						10 ¹³			Ω
		Shield to Coil						10 ¹¹			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						500			VDC
(Static)		Contacts to Shield						1000			VDC
		Contacts to Coil						1000			VDC
		Shield to Coil						1000			VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

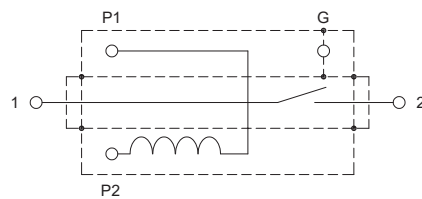
*1 GTNE : $10^{13} \Omega$ (□ : Insulation resistance classification)
GTOE : $10^{14} \Omega$

Dimensions < All Dimensions are mm [inch] >

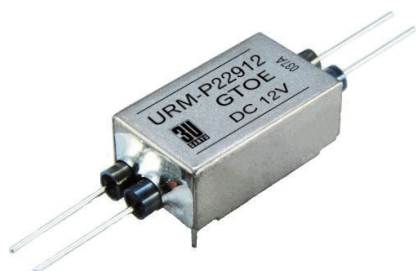
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



URM-P2A: High Insulation PCB & Axial Relay



This series features a semi-tubular reed relay with a 2 Form A contact, incorporating dual shielding—electromagnetic and electrostatic—for superior performance. It is one of our flagship products, setting the standard in high-insulation applications.

Characteristics

- Insulation resistance: 1000VDC (500VDC between contacts)
- Insulation resistance: $\geq 10^{13}\Omega$
- Electrical lifespan: 1 billion (@ 1V 10mA)

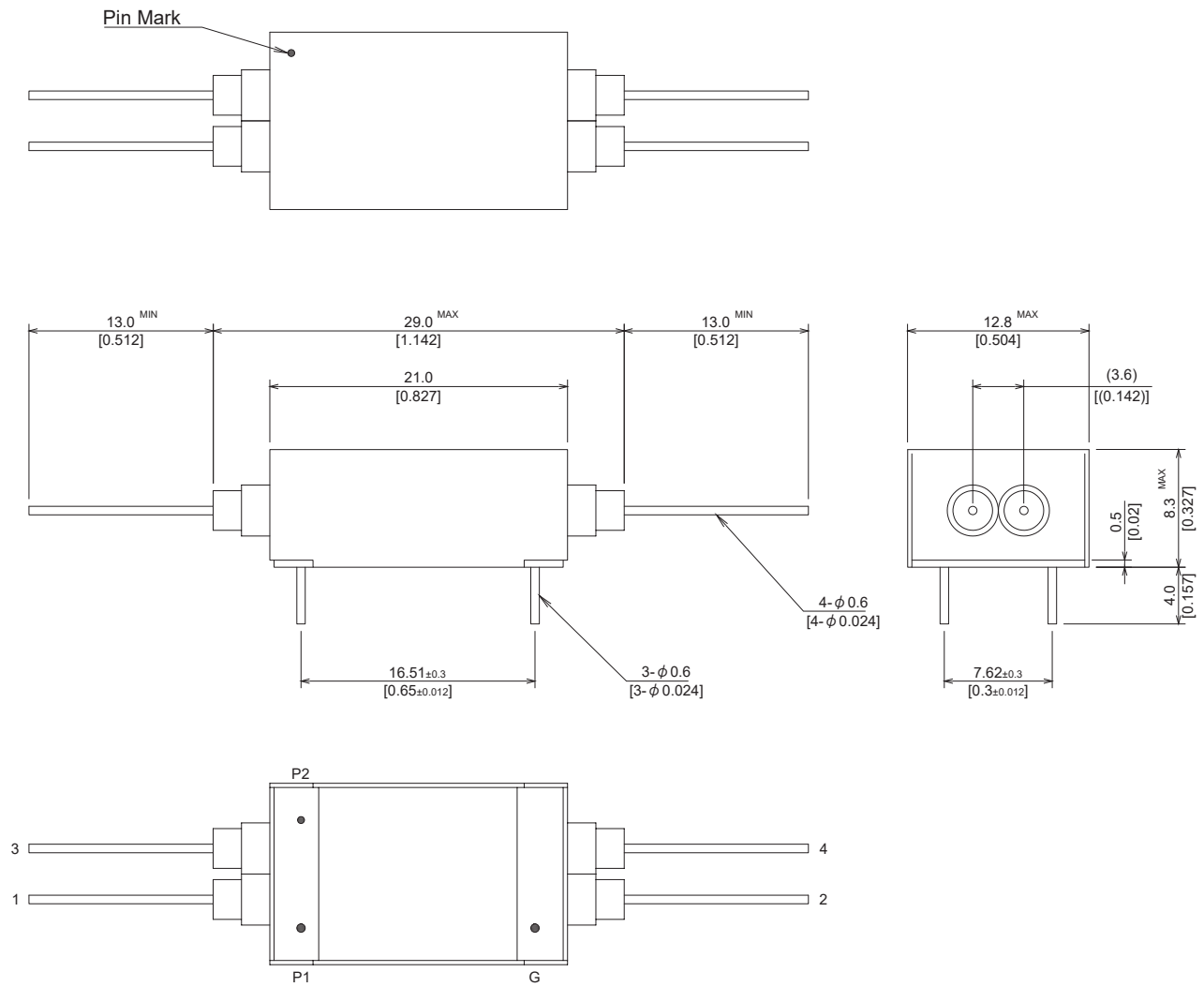


URM 2A Series		URM-P22905GT□E			URM-P22912GT□E			URM-P22924GT□E			
Contact Form		2 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		260			1500			6000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								350	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						1000			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						*1			Ω
		Contacts to Shield						10 ¹³			Ω
		Contacts to Coil						10 ¹³			Ω
		Shield to Coil						10 ¹¹			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						500			VDC
(Static)		Contacts to Shield						1000			VDC
		Contacts to Coil						1000			VDC
		Shield to Coil						1000			VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

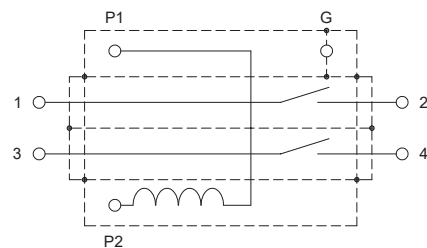
*1 GTNE : 10¹³ Ω (□ : Insulation resistance classification)
GTOE : 10¹⁴ Ω

Dimensions < All Dimensions are mm [inch] >

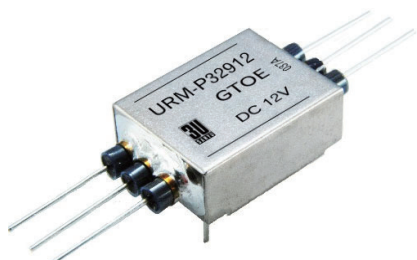
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



URM-P3A: High Insulation PCB & Axial Relay



This series features a semi-tubular reed relay with a 3 Form A contact, incorporating dual shielding—electromagnetic and electrostatic—for superior performance. It is one of our flagship products, setting the standard in high-insulation applications.

Characteristics

- Insulation resistance: 1000VDC (500VDC between contacts)
- Insulation resistance: $\geq 10^{13}\Omega$
- Electrical lifespan: 1 billion (@ 1V 10mA)

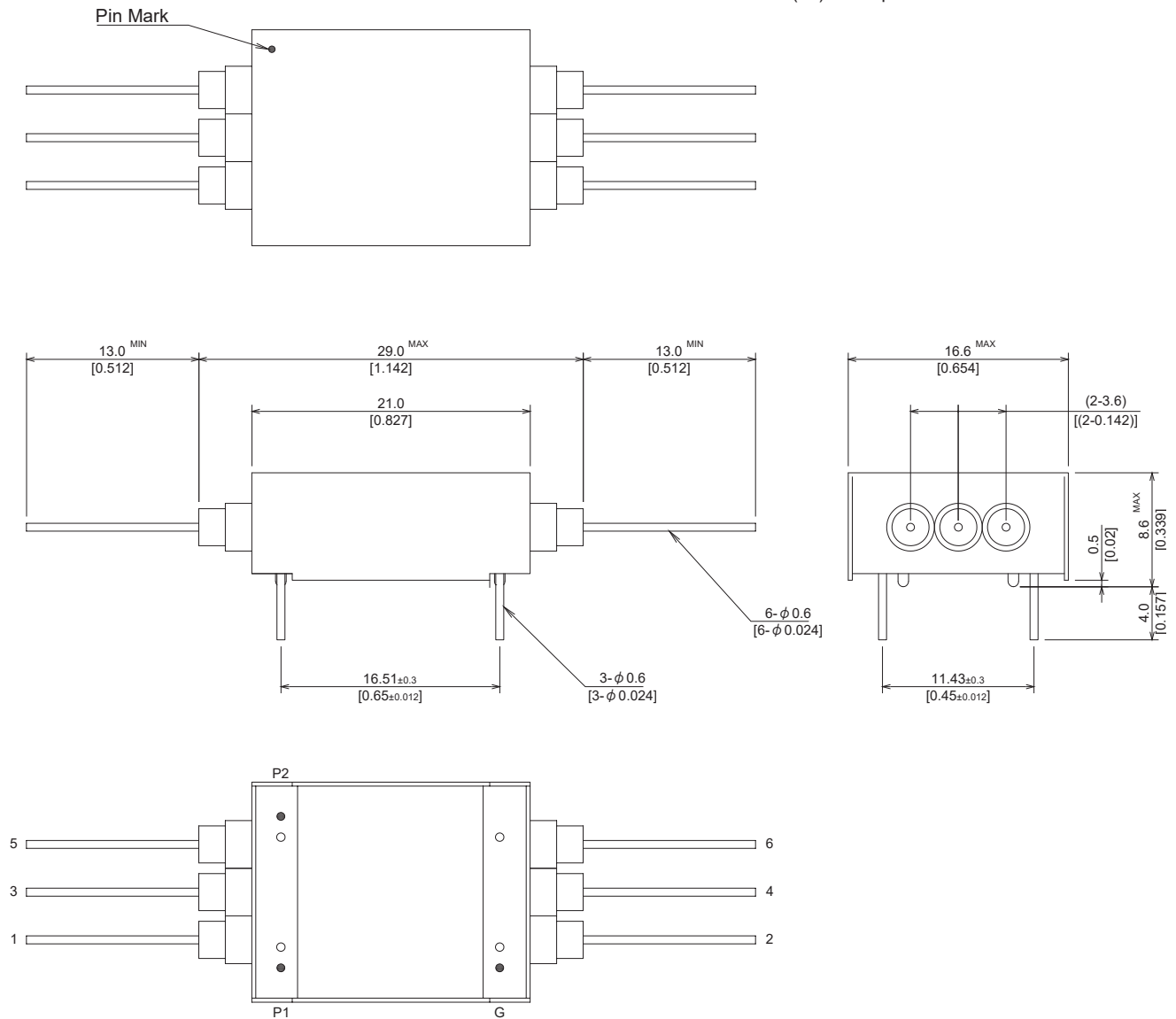


URM 3A Series		URM-P32905GT□E			URM-P32912GT□E			URM-P32924GT□E			
Contact Form		3 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		180			1000			4000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								350	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								2.8	A
Contact Rating		DC/Peak AC resistance								50	W
Life Expectancy		at 1V 10mA						1000			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						*1			Ω
		Contacts to Shield						10 ¹³			Ω
		Contacts to Coil						10 ¹³			Ω
		Shield to Coil						10 ¹¹			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						500			VDC
(Static)		Contacts to Shield						1000			VDC
		Contacts to Coil						1000			VDC
		Shield to Coil						1000			VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

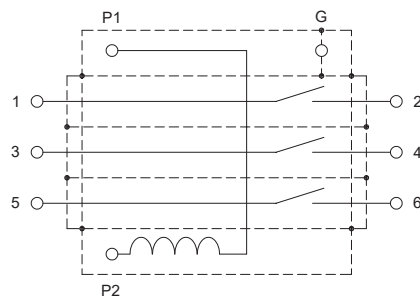
*1 GTNE : $10^{13} \Omega$ (□ : Insulation resistance classification)
 GTOE : $10^{14} \Omega$

Dimensions < All Dimensions are mm [inch] >

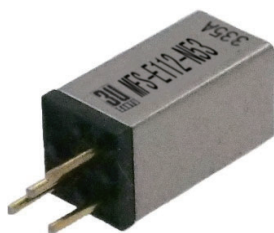
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



MFS-1A: High Temperature Resistant Ultra-Compact Vertical PCB Relay



This series is oriented vertically to take up minimal mount area. This series is highly praised by probe card manufacturers who need ultra minimum mount density. Furthermore, these relays can also be used in high temperature environments.

Characteristics

- Mount area: 4.9mm x 4.9mm
- High temperature range: -20°C to +155°C
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



MFS 1A Series		MFS-E105□-53			MFS-E112□-53			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		100			450		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			*1			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			*1			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			*2			VDC
		Contacts to Coil			250			VDC
		Shield to Coil			*2			VDC
Operate Time		at Nominal Coil Voltage					0.3	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.3	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +155°C		
Humidity		: 25% to 75%RH		Storage temp		: -25°C to +155°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

★ □ : N No electrostatic shielding Fig. 1

G With electrostatic shielding Fig. 2

*1 Insulation Resistance: 10¹⁰Ω

*2 Breakdown voltage: 250V

Dimensions < All Dimensions are mm [inch] >

Fig.1

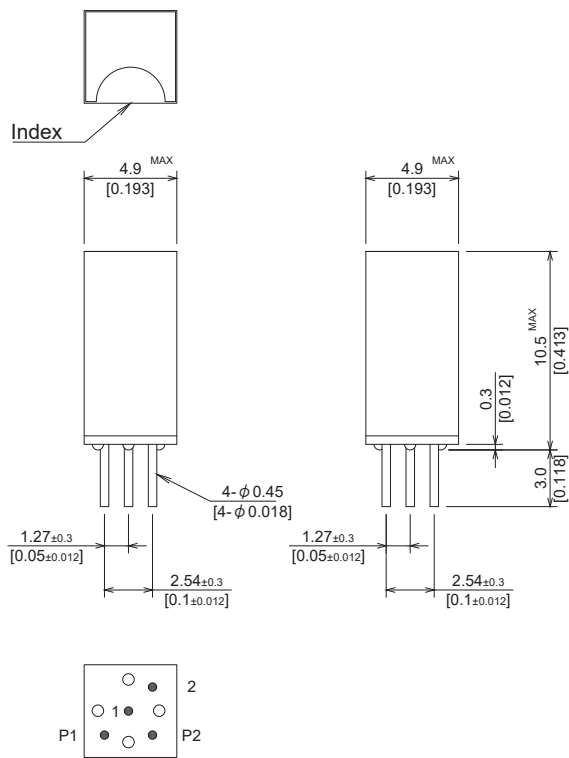
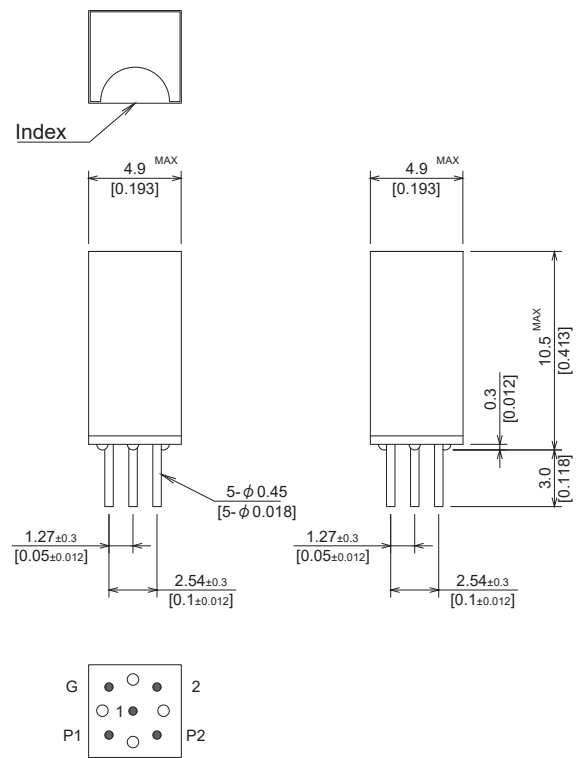
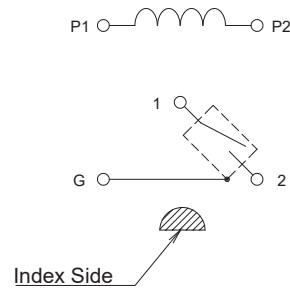
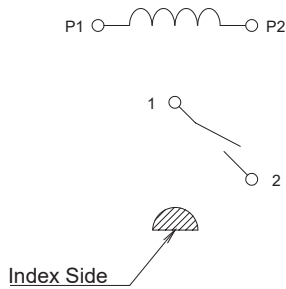


Fig.2



Schematic <Top View>



UF-2A: High Temperature Resistant Compact Vertical PCB Relay



This 2 Form A product maintains the characteristics of standard PCB mount relays (mount area: 20.32 x 5.08mm) while accomplishing a 50% reduction in mount area by configuring the relay vertically. Furthermore, these relays can also be used in high temperature environments.

Characteristics

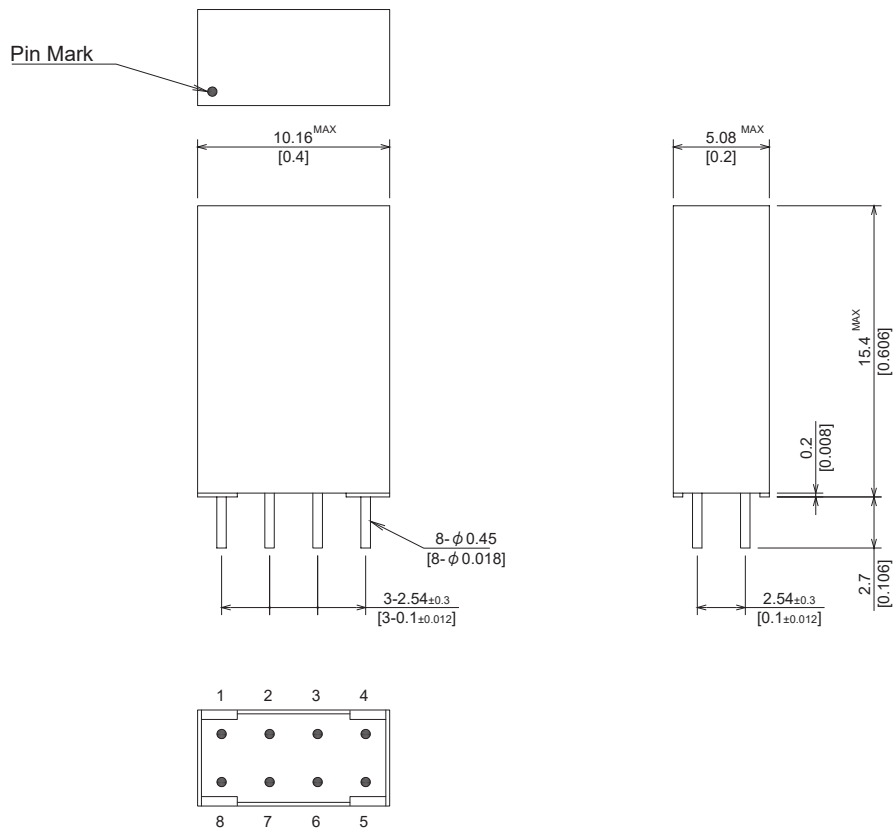
- Mount area: 10.16mm x 5.08mm
- High temperature range: -20°C to +125°C
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



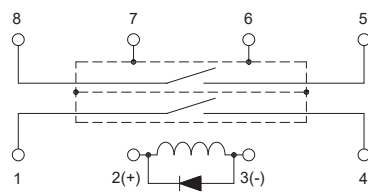
UF 2A Series		UF-E2A05Z-0150			UF-E2A12Z-0150			
Contact Form		2 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage	±10% @20°C @20°C @20°C		5.0			12.0		VDC
Coil Resistance			180			680		Ω
Must Operate				3.75			8.8	VDC
Must Release		0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance			300		100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA						x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰		Ω	
		Contacts to Coil			10 ¹⁰		Ω	
		Shield to Coil			10 ¹⁰		Ω	
		(at 100V 20°C 65%)						
Dielectric Strength (Static)		Between Contacts			200			VDC
		Contacts to Shield			200		VDC	
		Contacts to Coil			200		VDC	
		Shield to Coil			200		VDC	
Operate Time (Including Bounce)		at Nominal Coil Voltage					0.5	msec
		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +125°C		
Humidity		: 25% to 75%RH		Storage temp		: -25°C to +130°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



* Coil polarities, (+) and (-).

UF-1A1B: High Temperature Resistant Compact Vertical PCB Relay



This 1A1B product maintains the characteristics of standard PCB mount relays (mount area: 20.32 x 5.08mm) while accomplishing a 50% reduction in mount area by configuring the relay vertically. Furthermore, these relays can also be used in high temperature environments.

Characteristics

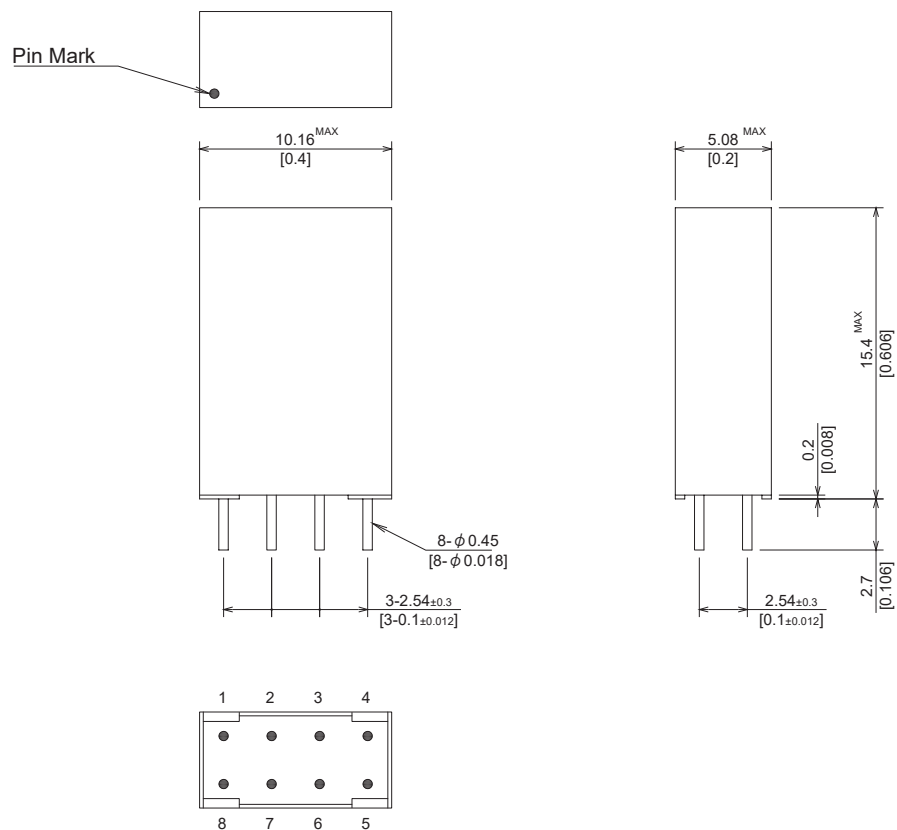
- Mount area: 10.16mm x 5.08mm
- High temperature range: -20°C to +125°C
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



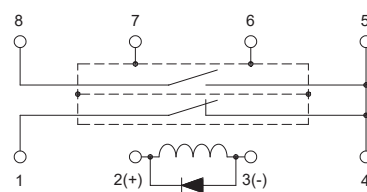
UF 1A1B Series		UF-E1T05Z-0150			UF-E1T12Z-0150				
Contact Form		1 Form C (A + B)							
Coil Specifications									
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units	
Coil Voltage	±10% @20°C @20°C @20°C @20°C		5.0	5.5		12.0	13.2	VDC	
Coil Resistance			130			680		Ω	
Must Operate				3.75			8.8	VDC	
Must Release			0.7		1.2			VDC	
Contact Ratings / Product Specifications									
Test Parameters		Test Conditions				Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance				300		100	V
Switching Current		DC/Peak AC resistance						0.5	A
Carry Current		DC/Peak AC resistance(@30°C)						1.0	A
Contact Rating		DC/Peak AC resistance						10	W
Life Expectancy		at 1V 10mA							x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage						150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ	
Insulation Resistance		Between Contacts				10 ¹⁰			Ω
		Contacts to Shield				10 ¹⁰		Ω	
		Contacts to Coil				10 ¹⁰		Ω	
		Shield to Coil				10 ¹⁰		Ω	
		(at 100V 20°C 65%)							
Dielectric Strength (Static)		Between Contacts				200			VDC
		Contacts to Shield				200		VDC	
		Contacts to Coil				200		VDC	
		Shield to Coil				200		VDC	
Operate Time (Including Bounce)		at Nominal Coil Voltage						0.5	msec
		100Hz Square Wave							
Release Time		Diode Suppression						0.5	msec
Measurement Reference Condition				Environmental Ratings					
Temp : 15°C to 35°C				Operate temp : -20°C to +125°C					
Humidity : 25% to 75%RH				Storage temp : -25°C to +130°C					
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz					
				Shock : 50G's					

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

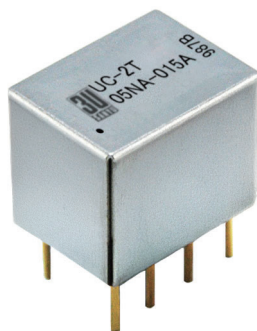


Schematic <Top View>



* Coil polarities, (+) and (-).

UC-2A2B: High Temperature Resistant Ultra-Compact PCB Relay



This series solves the contact resistance stability and lifespan problems of mechanical relays by using reed switches and can act as direct replacements for mechanical relays. The contact configuration is 2A2B, and this series is our smallest PCB relay. Furthermore, these relays can also be used in high temperature environments.

Characteristics

- Mount area: 10.16mm x 7.62mm
- High temperature range: -20°C to +105°C
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



UC 2A2B Series		UC-2T05NA-015A UC-2T05NAY-015A			UC-2T12NA-015A UC-2T12NAY-015A			UC-2T24NA-015A UC-2T24NAY-015A			
Contact Form		2 Form C (A + B)									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0	5.5		12.0	13.2		24.0	26.4	VDC
Coil Resistance	±10% @20°C		180			800			2400		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								100	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								200	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹¹			Ω
		Contacts to Shield									Ω
		Contacts to Coil						10 ¹¹			Ω
		Shield to Coil									Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield									VDC
		Contacts to Coil						500			VDC
		Shield to Coil									VDC
Operate Time		at Nominal Coil Voltage								0.3	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								0.3	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +105°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +115°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

- ★ UC-2TxxNA-015A Fig.1
UC-2TxxNAY-015A Fig.2

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

Fig.1

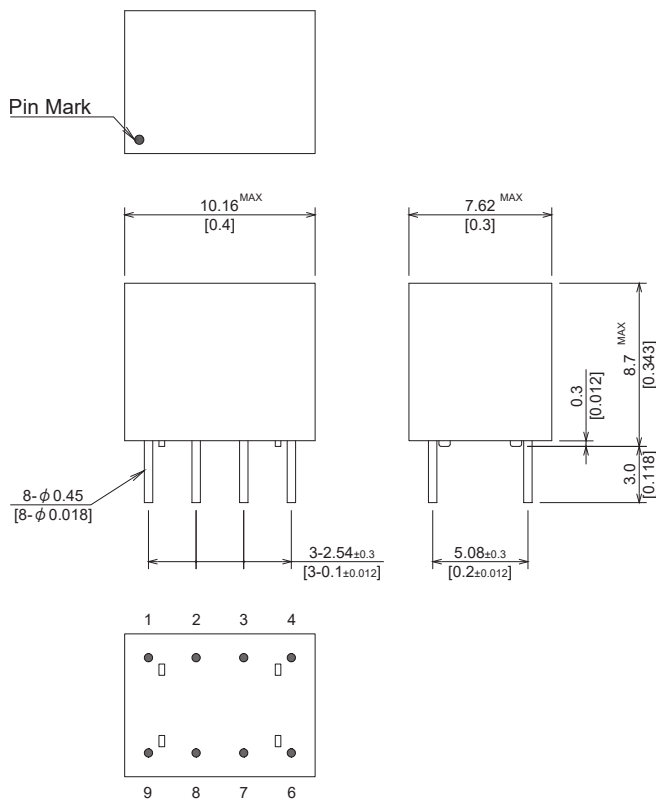
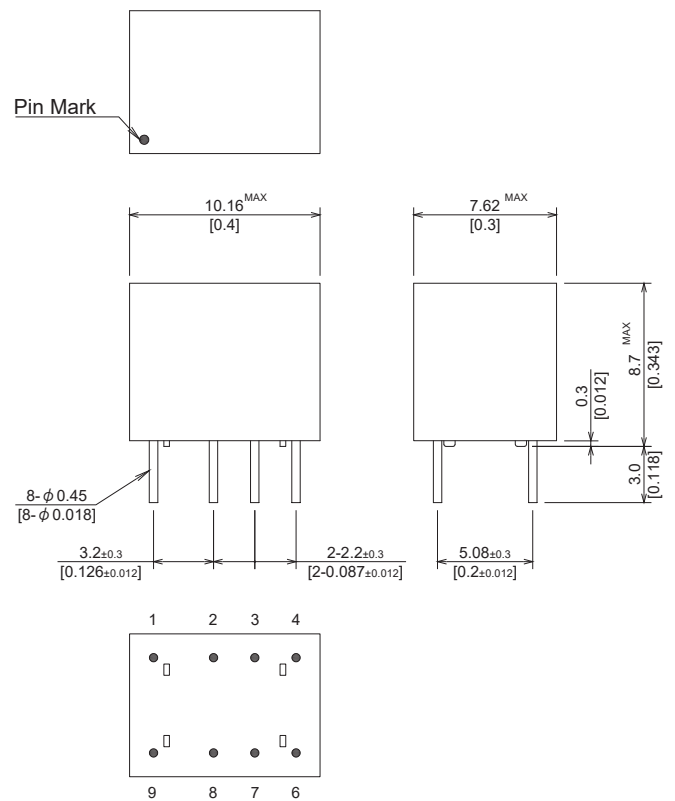
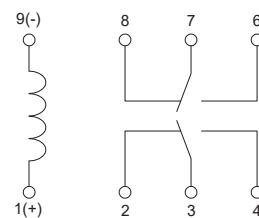
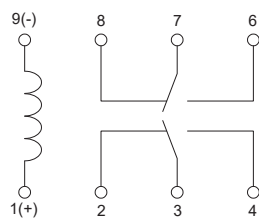


Fig.2

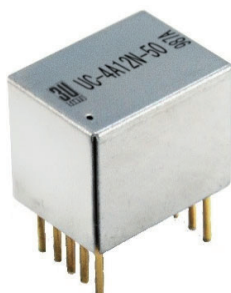


Schematic <Top View>



* Coil polarities, (+) and (-).

UC-4A: High Temperature Resistant Ultra-Compact PCB Relay



This product was developed with the aim of achieving high density while also utilizing multiple contacts. This relay has a 4 Form A contact configuration, and is our smallest PCB relay. This product is widely used for measurements of communication boards and parallel pulsed transmissions.

Characteristics

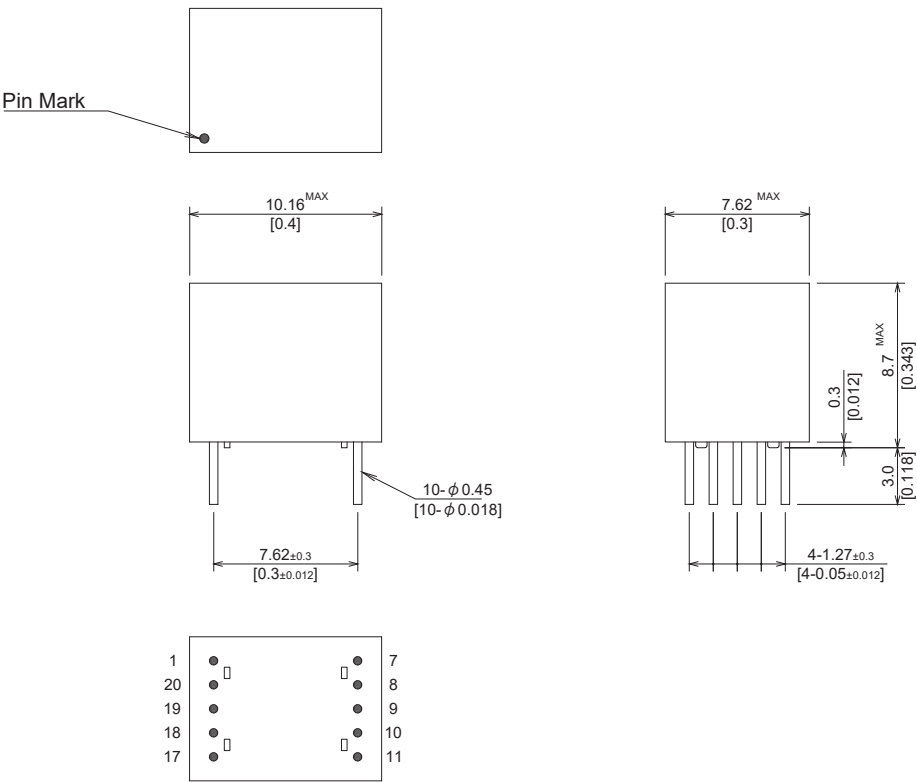
- Mount area: 10.16mm x 7.62mm
- High temperature range: -20°C to +105°C
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



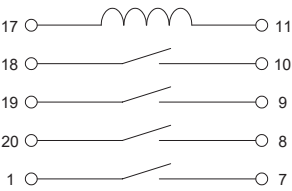
UC 4A Series		UC-4A05N-50			UC-4A12N-50			
Contact Form		4 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		150			800		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹¹			Ω
		Contacts to Shield						Ω
		Contacts to Coil			10 ¹¹			Ω
		Shield to Coil						Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield						VDC
		Contacts to Coil			500			VDC
		Shield to Coil						VDC
Operate Time		at Nominal Coil Voltage					0.3	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.2	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +105°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +115°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



FS-1A: High Density Ultra-Compact Vertical PCB Relay with LED



This product is oriented vertically to take up minimal mount area. This series is highly praised by probe card manufacturers who need maximum mount density. It has a 1 Form A contact configuration and the LED makes it easier to check on when debugging.

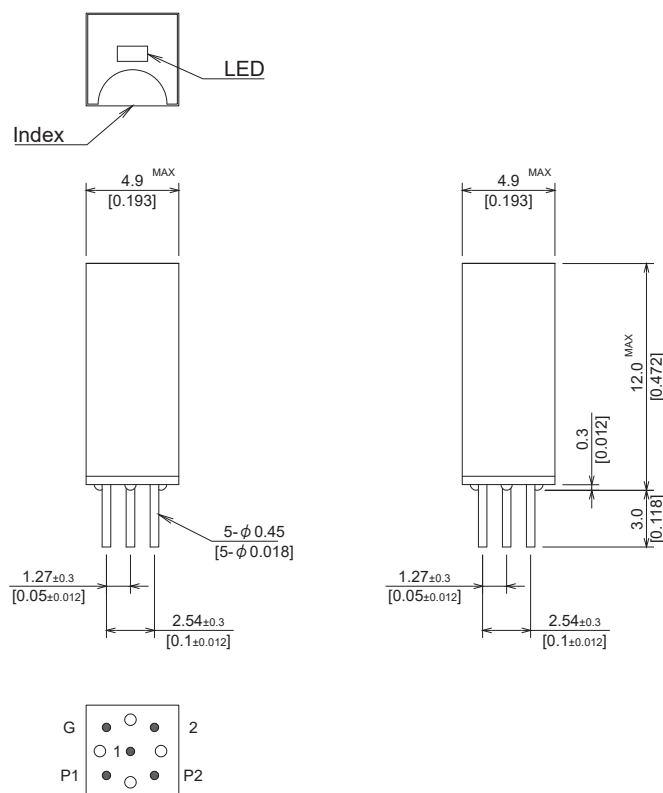
Characteristics

- Mount area: 4.9mm x 4.9mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)

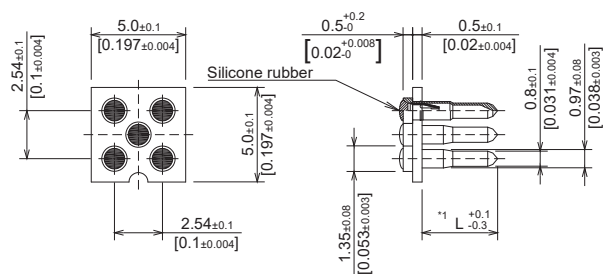


FS 1A Series		FS-E1A05			FS-E1A12			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		150			600		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			10 ¹⁰			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			250			VDC
		Contacts to Coil			250			VDC
		Shield to Coil			250			VDC
Operate Time		at Nominal Coil Voltage					0.3	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.3	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

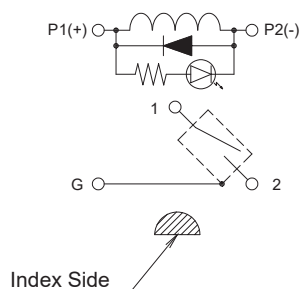


Relay Socket : MFX-5-L



*1
 L = 3.3 MFX-5-1.6
 L = 4.0 MFX-5-3.2
 L = 5.3 MFX-5-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

FS-2A: High Density Ultra-Compact Vertical PCB Relay with LED



This product is oriented vertically to take up minimal mount area. This series is highly praised by probe card manufacturers who need maximum mount density. It has a 2 Form A contact configuration and the LED makes it easier to check on when debugging.

Characteristics

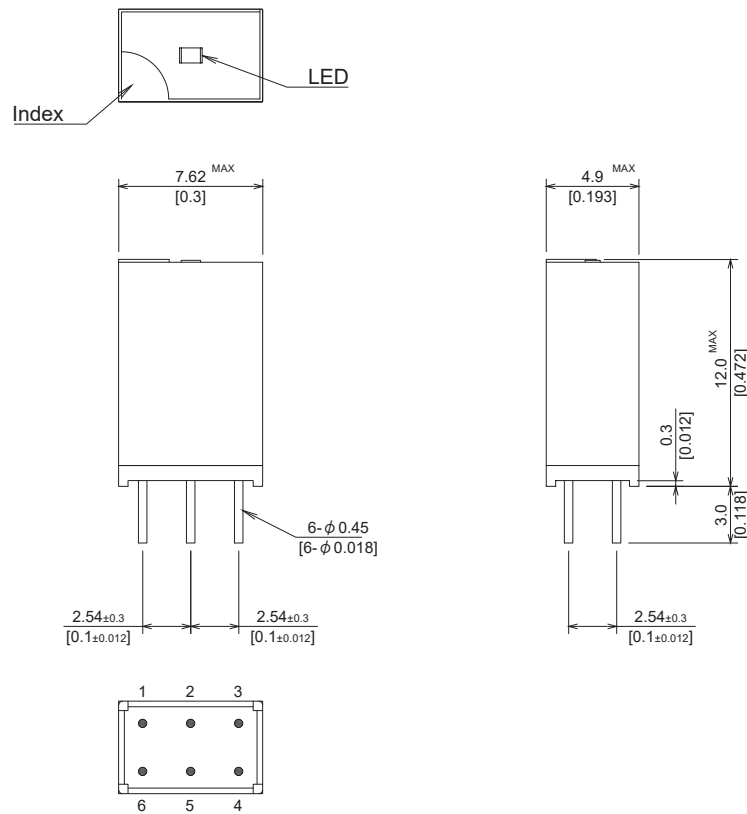
- Mount area: 7.62mm x 4.9mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



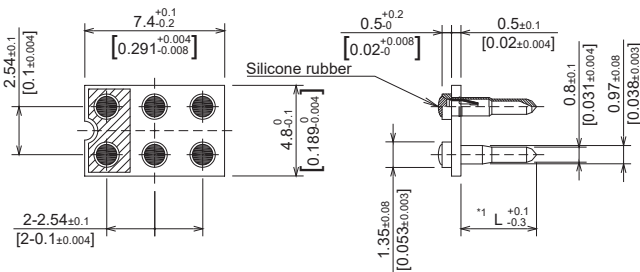
FS 2A Series		FS-E2A05			FS-E2A12			
Contact Form		2 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		110			550		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					170	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield						Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil						Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield						VDC
		Contacts to Coil			250			VDC
		Shield to Coil						VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +60°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Index corresponds to the terminal number 1.

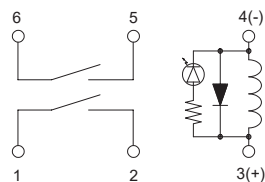


Relay Socket : MSX-6-L



*1
 L = 3.3 MSX-6-1.6
 L = 4.0 MSX-6-3.2
 L = 5.3 MSX-6-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

FS-1A1B: High Density Ultra-Compact Vertical PCB Relay with LED



This product is oriented vertically to take up minimal mount area. This series is highly praised by probe card manufacturers who need maximum mount density. It has a 1A1B contact configuration and the LED makes it easier to check on when debugging.

Characteristics

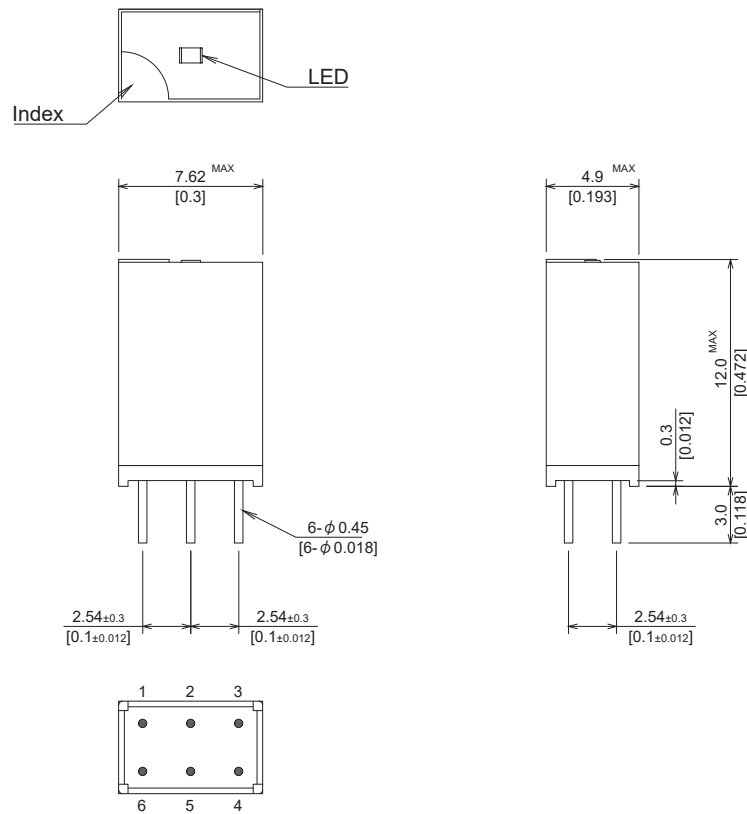
- Mount area: 7.62mm x 4.9mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V 10mA)



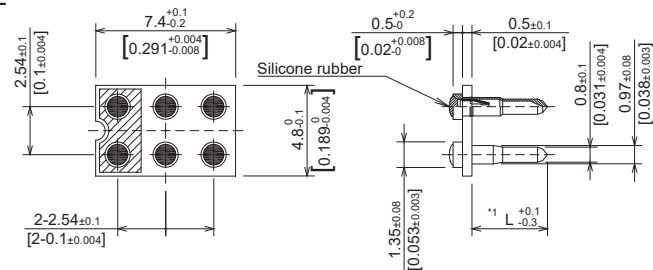
FS 1A1B Series		FS-E1T05			FS-E1T12			
Contact Form		1 Form C (A + B)						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0	5.5		12.0	13.2	VDC
Coil Resistance	±10% @20°C		110			550		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					170	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			10 ¹⁰			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			250			VDC
		Contacts to Coil			250			VDC
		Shield to Coil			250			VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp : 15°C to 35°C				Operate temp : -20°C to +60°C				
Humidity : 25% to 75%RH				Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz				
				Shock : 50G's				

Dimensions < All Dimensions are mm [inch] >

* Index corresponds to the terminal number 1.

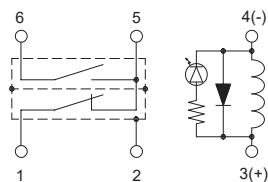


Relay Socket : MSX-6-L



*1
 L = 3.3 MSX-6-1.6
 L = 4.0 MSX-6-3.2
 L = 5.3 MSX-6-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

UF-1A: High Density Compact Vertical PCB Relay with LED



This 1 Form A product maintains the characteristics of standard PCB mount relays (mount area: 20.32 x 5.08mm) while accomplishing a 50% reduction in mount area by configuring the relay vertically. The LED also makes it easier to check on when debugging.

Characteristics

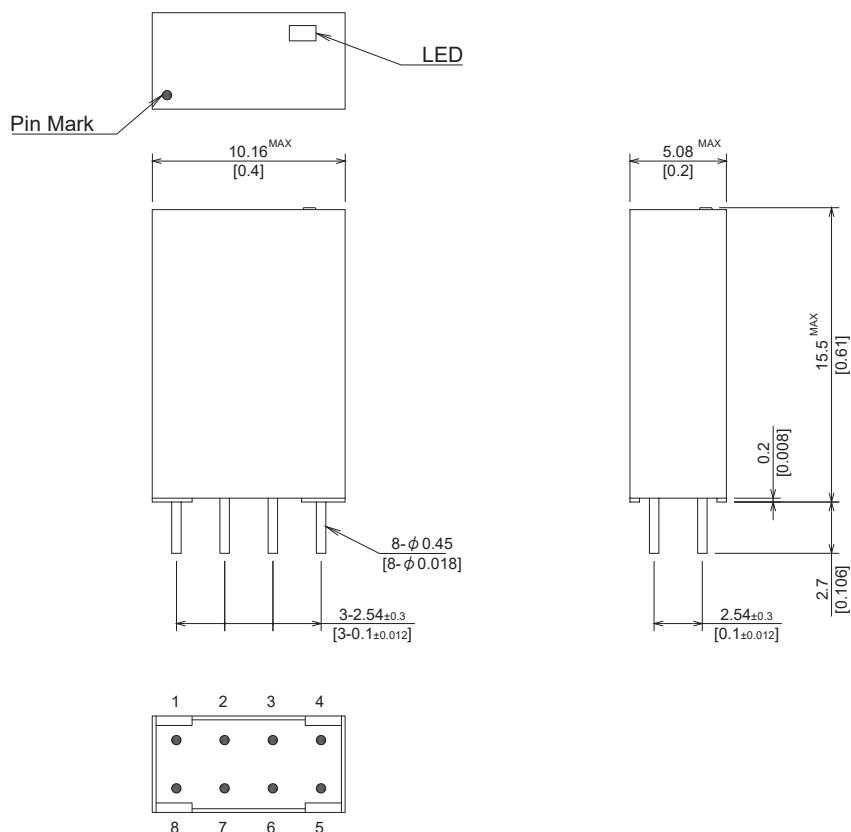
- Mount area: 10.16mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



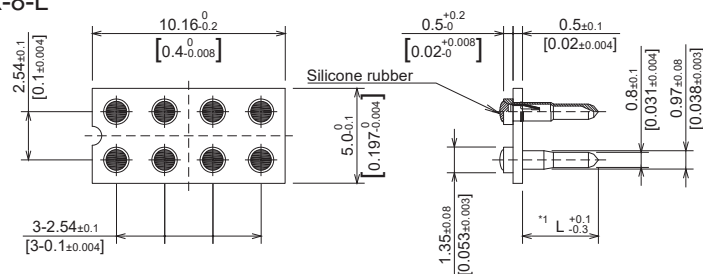
UF 1A Series		UF-1A05			UF-1A12			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		180			680		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					200	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			10 ¹⁰			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			200			VDC
		Contacts to Coil			200			VDC
		Shield to Coil			200			VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

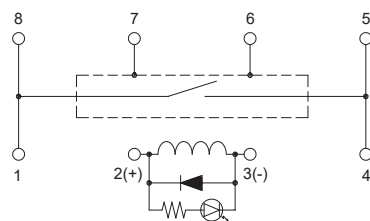


Relay Socket : UFX-8-L



*1
 L = 3.3 UFX-8-1.6
 L = 4.0 UFX-8-3.2
 L = 5.3 UFX-8-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

UF-2A: High Density Compact Vertical PCB Relay with LED



This 2 Form A product maintains the characteristics of standard PCB mount relays (mount area: 20.32 x 5.08mm) while accomplishing a 50% reduction in mount area by configuring the relay vertically. The LED also makes it easier to check on when debugging.

Characteristics

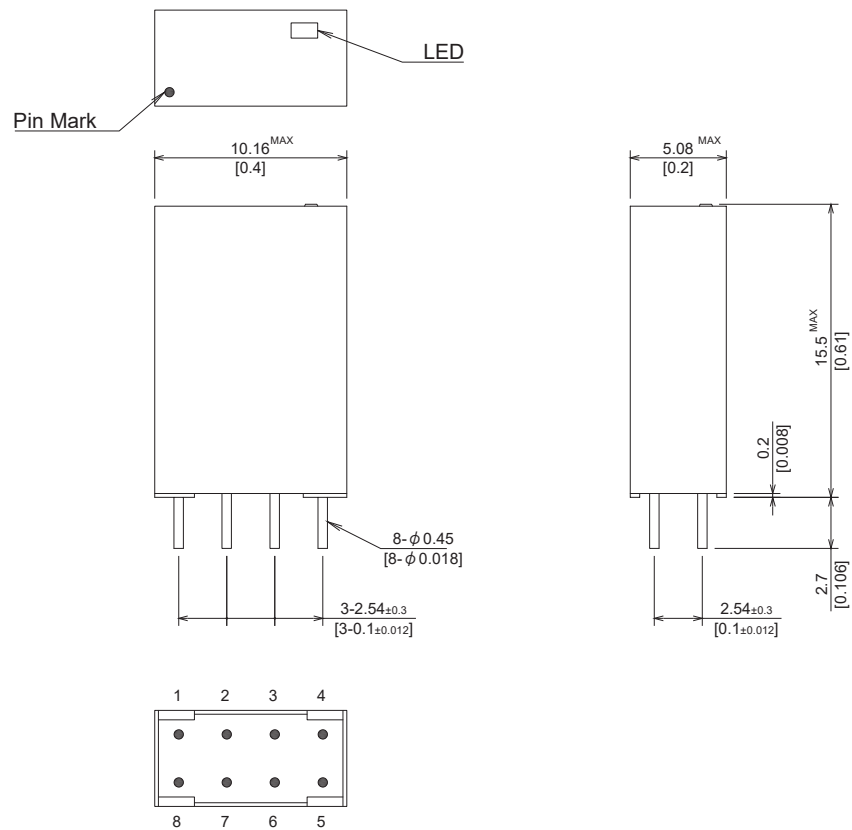
- Mount area: 10.16mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



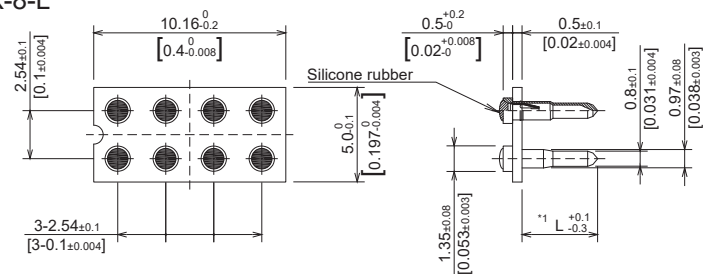
UF 2A Series		UF-2A05			UF-2A12			
Contact Form		2 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		180			680		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					200	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			10 ¹⁰			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			200			VDC
		Contacts to Coil			200			VDC
		Shield to Coil			200			VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

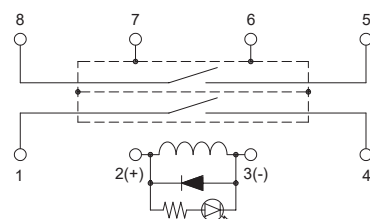


Relay Socket : UFX-8-L



*1
 L = 3.3 UFX-8-1.6
 L = 4.0 UFX-8-3.2
 L = 5.3 UFX-8-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

UF-1A1B: High Density Compact Vertical PCB Relay with LED



This 1A1B product maintains the characteristics of standard PCB mount relays (mount area: 20.32 x 5.08mm) while accomplishing a 50% reduction in mount area by configuring the relay vertically. The LED also makes it easier to check on when debugging.

Characteristics

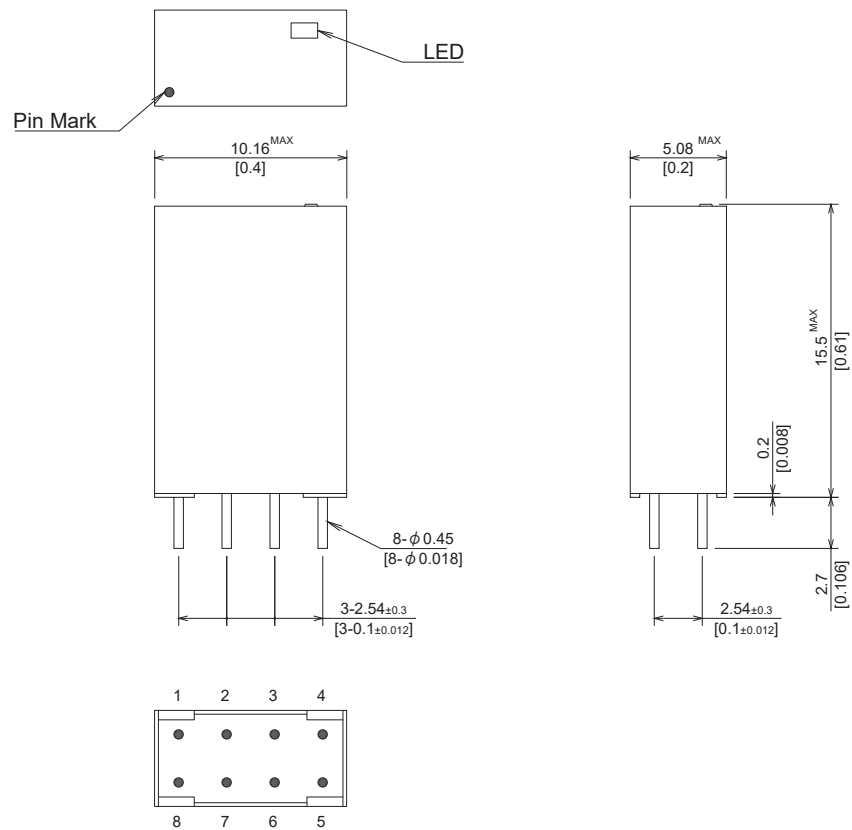
- Mount area: 10.16mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



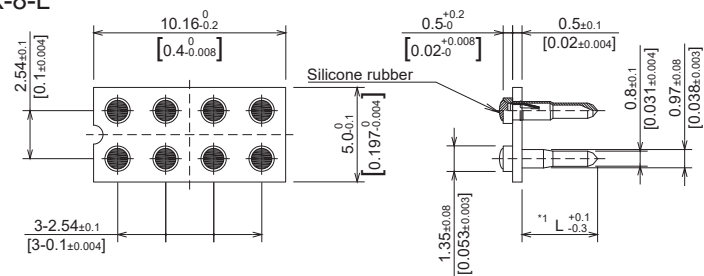
UF 1A1B Series		UF-1T05			UF-1T12			
Contact Form		1 Form C (A + B)						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0	5.5		12.0	13.2	VDC
Coil Resistance	±10% @20°C		130			680		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					200	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹⁰			Ω
		Contacts to Shield			10 ¹⁰			Ω
		Contacts to Coil			10 ¹⁰			Ω
		Shield to Coil			10 ¹⁰			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			200			VDC
		Contacts to Coil			200			VDC
		Shield to Coil			200			VDC
Operate Time		at Nominal Coil Voltage					1.0	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					1.0	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +60°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

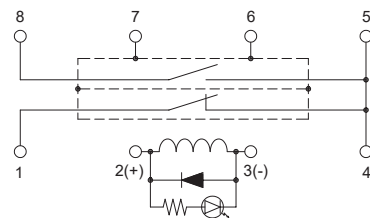


Relay Socket : UFX-8-L



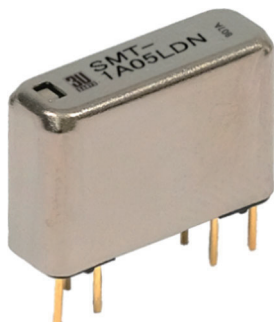
*1
 L = 3.3 UFX-8-1.6
 L = 4.0 UFX-8-3.2
 L = 5.3 UFX-8-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

SMT-1A: High Density Compact PCB Relay with LED



This product is 0.1" (2.54mm) larger than the SC series and 0.2" (5.08mm) larger than the UF series. The relay has a 1 Form A contact configuration and has an electrostatic shield and LED.

Characteristics

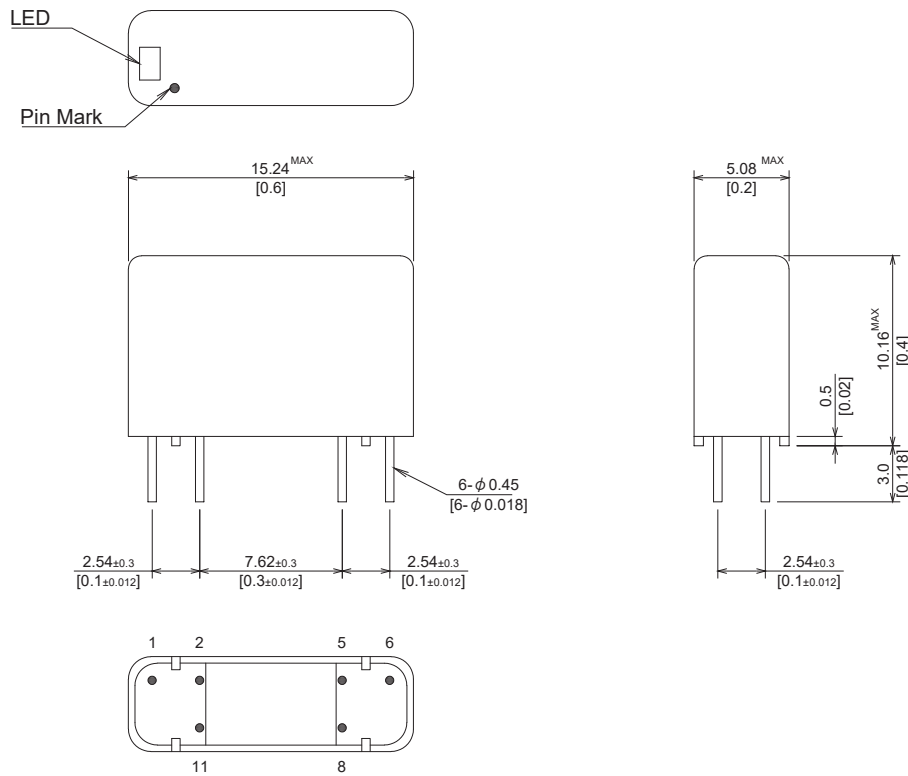
- Mount area: 15.24mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



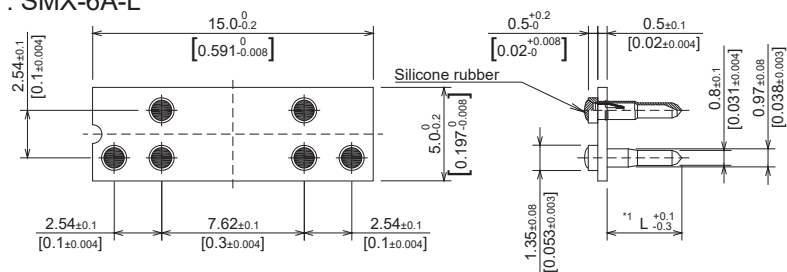
SMT 1A Series		SMT-1A05LDN			SMT-1A12LDN			SMT-1A24LDN			
Contact Form		1 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		180			680			2000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								200	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield						10 ¹⁰			Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil						10 ¹⁰			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield						200			VDC
		Contacts to Coil						200			VDC
		Shield to Coil						200			VDC
Operate Time		at Nominal Coil Voltage								0.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								0.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.



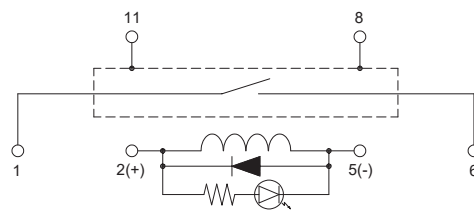
Relay Socket : SMX-6A-L



*1

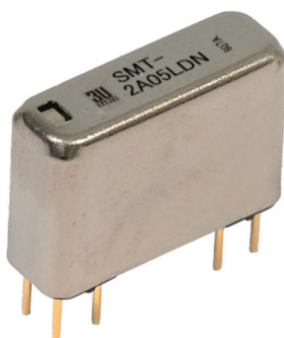
L = 3.3	SMX-6A-1.6
L = 4.0	SMX-6A-3.2
L = 5.3	SMX-6A-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

SMT-2A: High Density Compact PCB Relay with LED



This product is 0.1" (2.54mm) larger than the SC series and 0.2" (5.08mm) larger than the UF series. The relay has a 2 Form A contact configuration and has an electrostatic shield and LED.

Characteristics

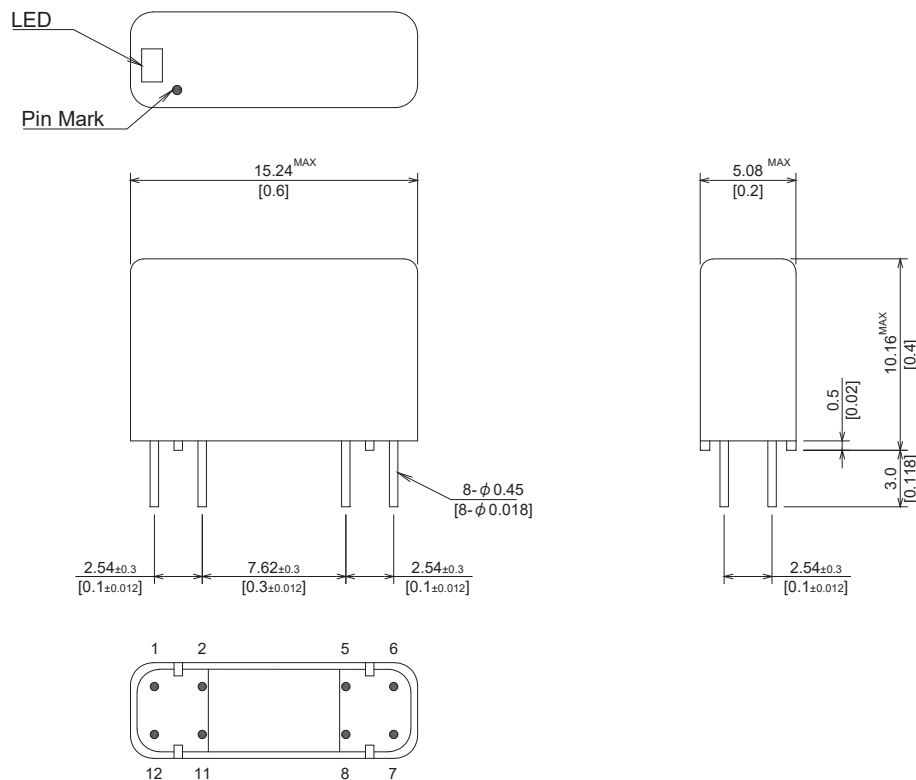
- Mount area: 15.24mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



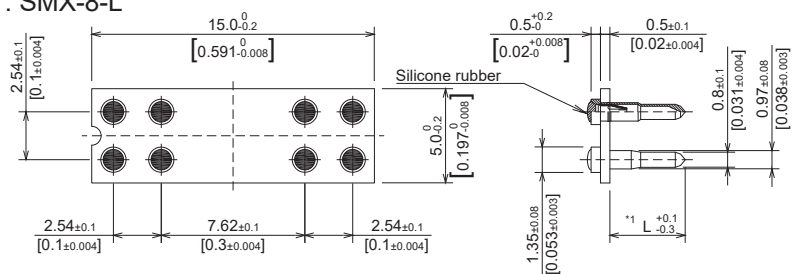
SMT 2A Series		SMT-2A05LDN			SMT-2A12LDN			SMT-2A24LDN			
Contact Form		2 Form A									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0			24.0		VDC
Coil Resistance	±10% @20°C		180			680			2000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								200	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield						10 ¹⁰			Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil						10 ¹⁰			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield						200			VDC
		Contacts to Coil						200			VDC
		Shield to Coil						200			VDC
Operate Time		at Nominal Coil Voltage								0.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								0.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +80°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

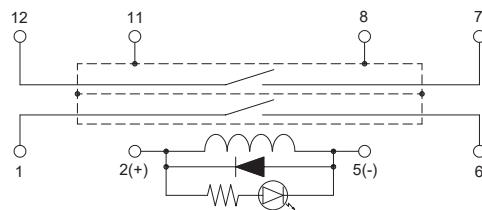


Relay Socket : SMX-8-L



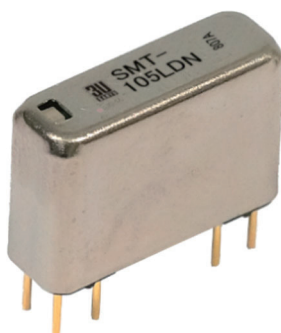
*1
 L = 3.3 SMX-8-1.6
 L = 4.0 SMX-8-3.2
 L = 5.3 SMX-8-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

SMT-1A1B: High Density Compact PCB Relay with LED



This product is 0.1" (2.54mm) larger than the SC series and 0.2" (5.08mm) larger than the UF series. The relay has a 1A1B contact configuration and has an electrostatic shield and LED.

Characteristics

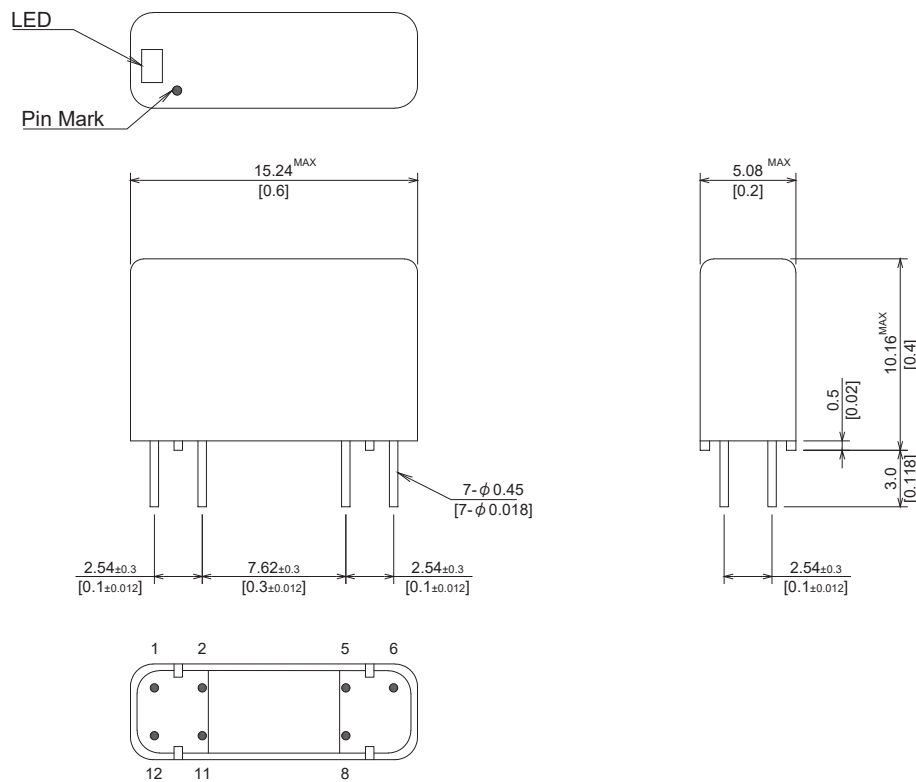
- Mount area: 15.24mm x 5.08mm
- Maximum contact rating: 10W
- Maximum switching voltage: 200VDC



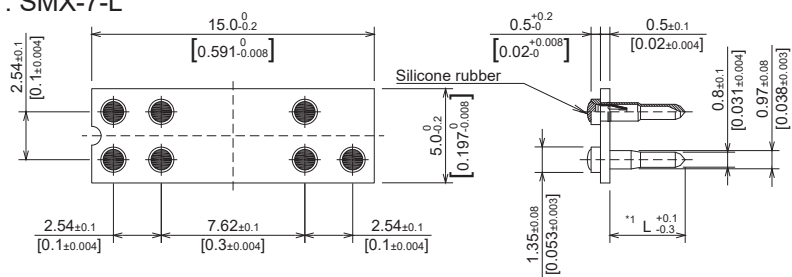
SMT 1A1B Series		SMT-105LDN			SMT-112LDN			SMT-124LDN			
Contact Form		1 Form C (A + B)									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0	5.5		12.0	13.2		24.0	26.4	VDC
Coil Resistance	±10% @20°C		180			680			2000		Ω
Must Operate	@20°C			3.75			8.8			17.6	VDC
Must Release	@20°C	0.7			1.2			2.4			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								200	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						100			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹⁰			Ω
		Contacts to Shield						10 ¹⁰			Ω
		Contacts to Coil						10 ¹⁰			Ω
		Shield to Coil						10 ¹⁰			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield						200			VDC
		Contacts to Coil						200			VDC
		Shield to Coil						200			VDC
Operate Time		at Nominal Coil Voltage								1.0	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								1.0	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

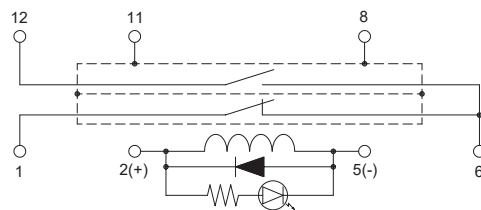


Relay Socket : SMX-7-L



*1
 L = 3.3 SMX-7-1.6
 L = 4.0 SMX-7-3.2
 L = 5.3 SMX-7-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

FL-1A: High Density Ultra-Compact Vertical PCB Relay



This product is designed in a vertical configuration to minimizing mount area and ensure contact capacity. This product achieves a carry current of 1.3A at 30°C in a mount area of 3.9mm x 3.9mm. The electrical lifespan is 1.5 billion cycles.

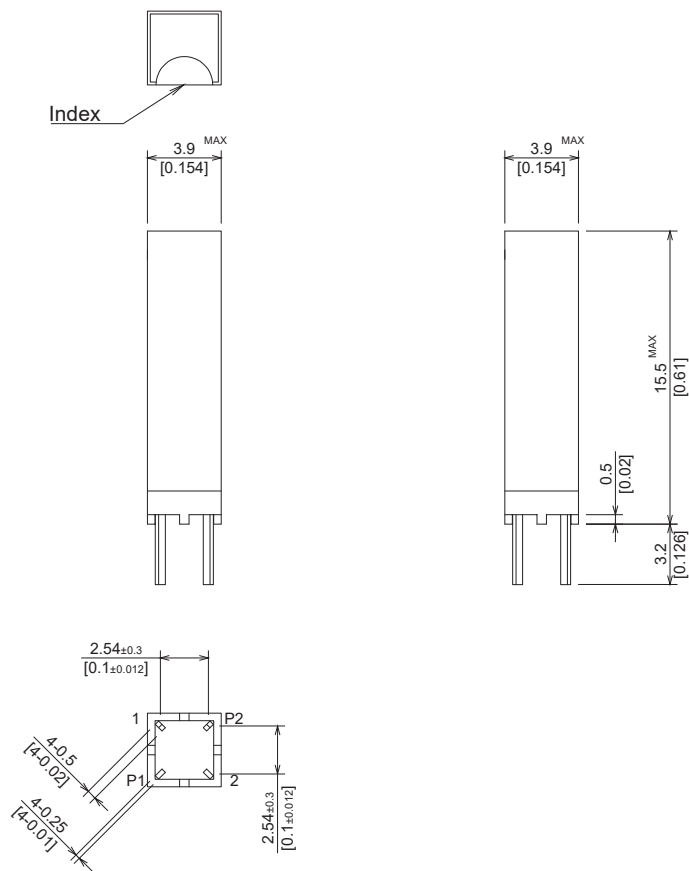
Characteristics

- Mount area: 3.9mm x 3.9mm
- Max contact rating: 30W
- Max switching voltage: 200VDC
- Electrical lifespan: 1.5 billion (@ 1V,10mA)

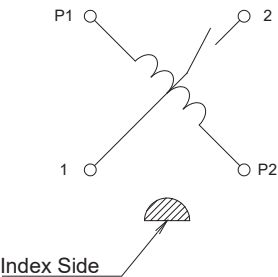


FL 1A Series		FL-E1A05N			FL-E1A12N			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		200			600		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					200	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.3	A
Contact Rating		DC/Peak AC resistance					30	W
Life Expectancy		at 1V 10mA			1500			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹²			Ω
		Contacts to Shield						Ω
		Contacts to Coil						Ω
		Shield to Coil						Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			300			VDC
(Static)		Contacts to Shield						VDC
		Contacts to Coil			300			VDC
		Shield to Coil						VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.2	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >



Schematic <Top View>



NEW

FC-2A: High Density Ultra-Compact Vertical PCB Relay



Designed for semiconductor testing applications requiring multiple signal line switching, this relay features a 2 Form A contact configuration and offers a contact rating of 10W, a dielectric strength of 200VDC, and a 1A current current—all within a compact mount area of 6.9mm × 4.9mm.

Characteristics

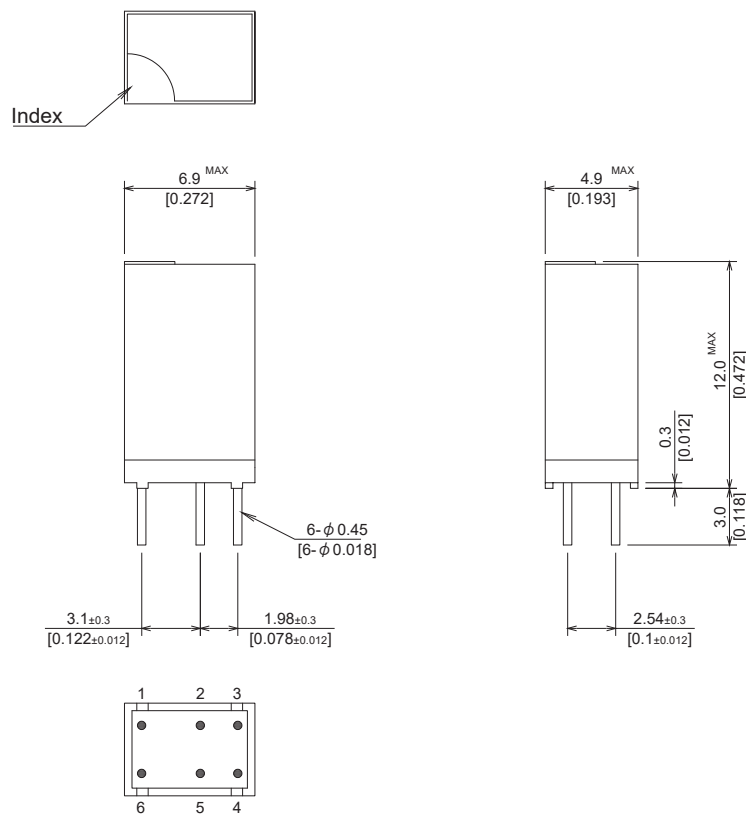
- Mount area: 6.9mm x 4.9mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V, 10mA)



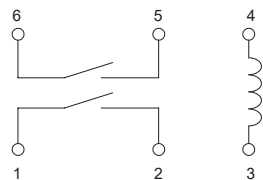
FC 2A Series		FC-E2A05N			FC-E2A12N			
Contact Form		2 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		200			700		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹²			Ω
		Contacts to Shield						Ω
		Contacts to Coil			10 ¹²			Ω
		Shield to Coil						Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield						VDC
		Contacts to Coil			500			VDC
		Shield to Coil						VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.5	msec
Measurement Reference Condition				Environmental Ratings				
Temp : 15°C to 35°C				Operate temp : -20°C to +80°C				
Humidity : 25% to 75%RH				Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz				
				Shock : 50G's				

Dimensions < All Dimensions are mm [inch] >

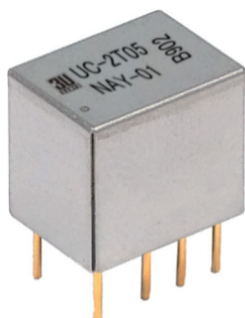
* Index corresponds to the terminal number 1.



Schematic <Top View>



UC-2A2B: High Density Ultra-Compact PCB Relay



This series solves the contact resistance stability and lifespan problems of mechanical relays by using reed switches and can act as direct replacements for mechanical relays. The contact configuration is 2A2B, and this series is our smallest PCB relay.

Characteristics

- Mount area: 10.16mm x 7.62mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V,10mA)



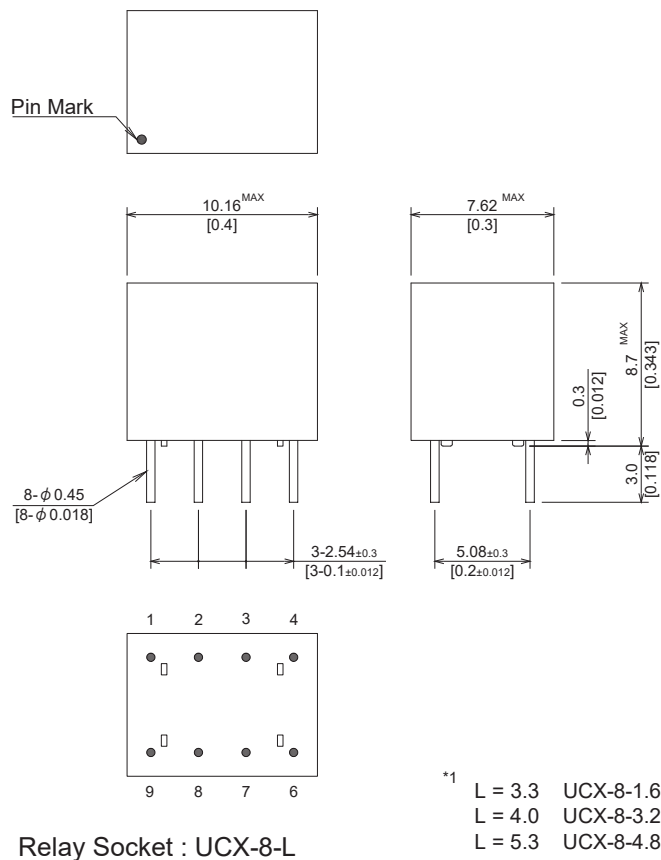
UC 2A2B Series		UC-2T05NA-01 UC-2T05NAY-01			UC-2T12NA-01 UC-2T12NAY-01				
Contact Form		2 Form C (A + B)							
Coil Specifications									
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units	
Coil Voltage			5.0	5.5		12.0	13.2	VDC	
Coil Resistance	±10% @20°C		150			600		Ω	
Must Operate	@20°C			3.75			8.8	VDC	
Must Release	@20°C	0.7			1.2			VDC	
Contact Ratings / Product Specifications									
Test Parameters		Test Conditions				Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance						100	V
Switching Current		DC/Peak AC resistance						0.5	A
Carry Current		DC/Peak AC resistance(@30°C)						1.0	A
Contact Rating		DC/Peak AC resistance						10	W
Life Expectancy		at 1V 10mA				300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage						150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage						5	mΩ
Insulation Resistance		Between Contacts				10 ¹¹			Ω
		Contacts to Shield							Ω
		Contacts to Coil				10 ¹¹			Ω
		Shield to Coil							Ω
		(at 100V 20°C 65%)							
Dielectric Strength		Between Contacts				200			VDC
(Static)		Contacts to Shield							VDC
		Contacts to Coil				500			VDC
		Shield to Coil							VDC
Operate Time		at Nominal Coil Voltage						0.3	msec
(Including Bounce)		100Hz Square Wave							
Release Time		Diode Suppression						0.3	msec
Measurement Reference Condition				Environmental Ratings					
Temp		: 15°C to 35°C		Operate temp		: -20°C to +60°C			
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C			
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz			
				Shock		: 50G's			

★ UC-2TxxNA-01 Fig.1
UC-2TxxNAY-01 Fig.2

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

Fig.1



Relay Socket : UCX-8-L

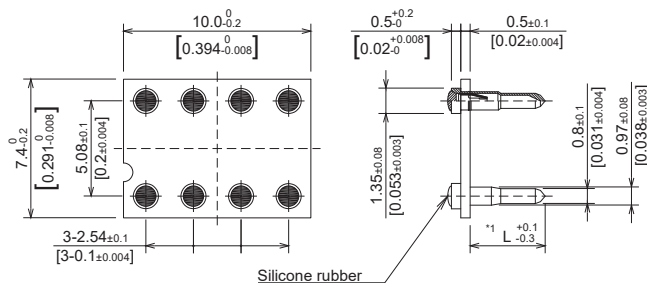
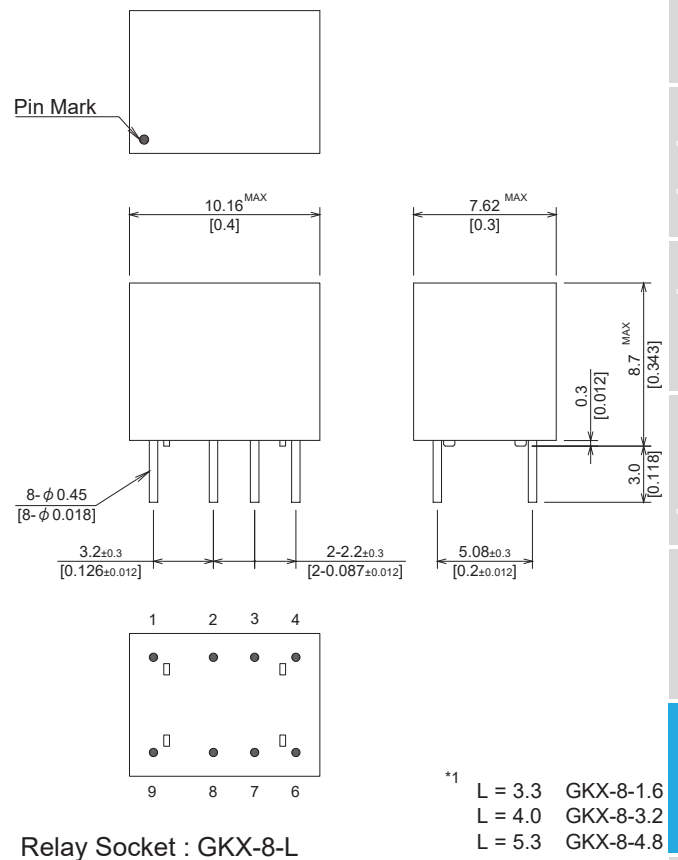
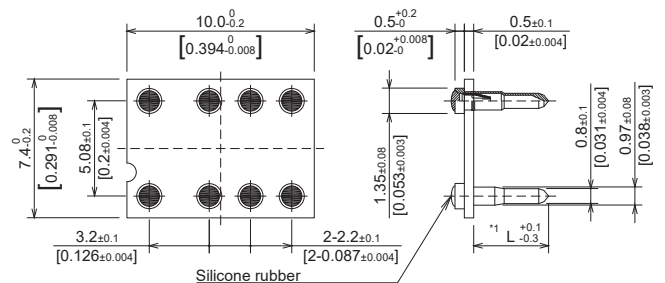


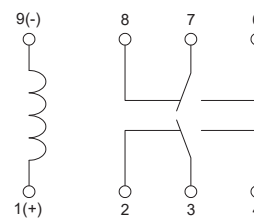
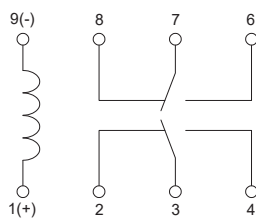
Fig.2



Relay Socket : GKX-8-L

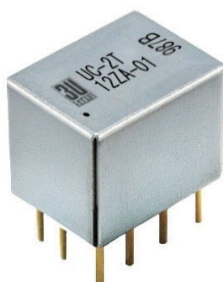


Schematic <Top View>



* Coil polarities, (+) and (-).

UC-2A2B: High Density Ultra-Compact PCB Relay



This series solves the contact resistance stability and lifespan problems of mechanical relays by using reed switches and can act as direct replacements for mechanical relays. The contact configuration is 2A2B, and this series is our smallest PCB relay. These relays also include an electrostatic shield and diode.

Characteristics

- Mount area: 10.16mm x 7.62mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V,10mA)



UC 2A2B Series		UC-2T12Z-01 / UC-2T12ZA-01					
Contact Form		2 Form C (A + B)					
Coil Specifications							
Parameters	Conditions	Min	Nom	Max	Units		
Coil Voltage			12.0	13.2	VDC		
Coil Resistance	±10% @20°C		600		Ω		
Must Operate	@20°C			8.8	VDC		
Must Release	@20°C	1.2			VDC		
Contact Ratings / Product Specifications							
Test Parameters		Test Conditions		Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance				100	V
Switching Current		DC/Peak AC resistance				0.5	A
Carry Current		DC/Peak AC resistance(@30°C)				1.0	A
Contact Rating		DC/Peak AC resistance				10	W
Life Expectancy		at 1V 10mA		300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage				150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage				5	mΩ
Insulation Resistance		Between Contacts		10 ¹¹			Ω
		Contacts to Shield		10 ¹¹			Ω
		Contacts to Coil		10 ¹¹			Ω
		Shield to Coil		10 ¹¹			Ω
		(at 100V 20°C 65%)					
Dielectric Strength		Between Contacts		200			VDC
(Static)		Contacts to Shield		500			VDC
		Contacts to Coil		500			VDC
		Shield to Coil		500			VDC
Operate Time		at Nominal Coil Voltage				0.3	msec
(Including Bounce)		100Hz Square Wave					
Release Time		Diode Suppression				0.3	msec
Measurement Reference Condition			Environmental Ratings				
Temp : 15°C to 35°C			Operate temp : -20°C to +60°C				
Humidity : 25% to 75%RH			Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa			Vibration : 20G's to 2000Hz				
			Shock : 50G's				

★ UC-2T12Z-01 Fig.1
UC-2T12ZA-01 Fig.2

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

Fig.1

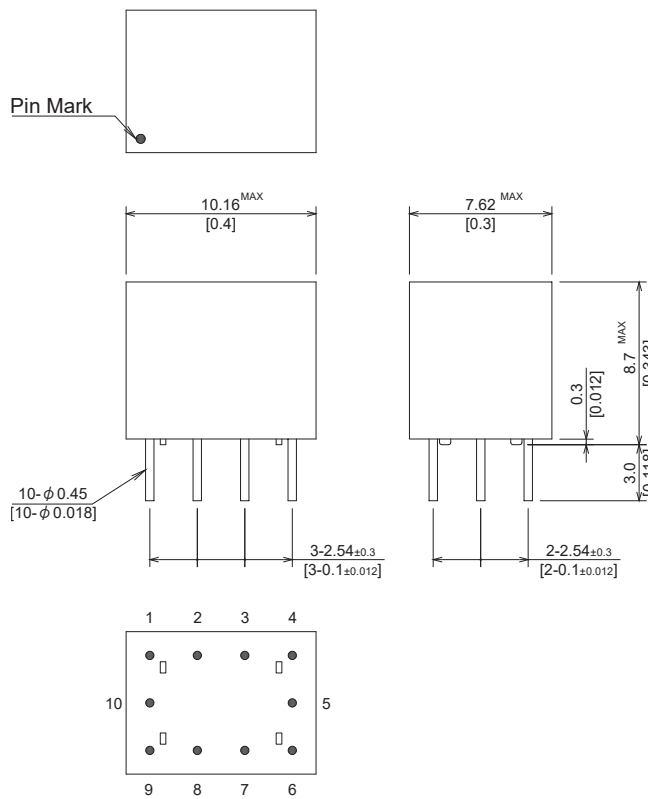
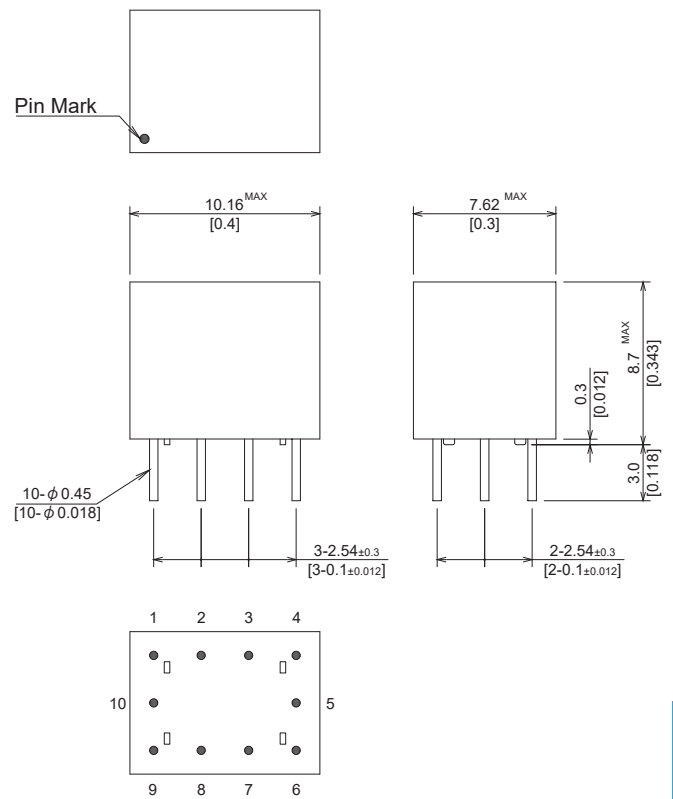
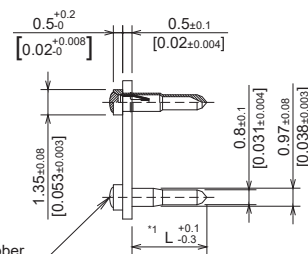
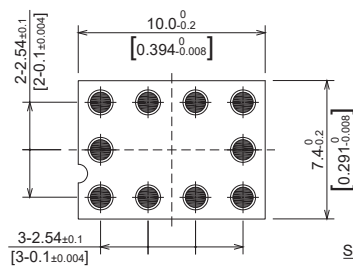


Fig.2

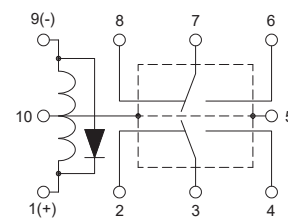
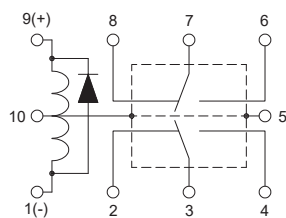


Relay Socket : UCX-10-L



*1 L = 3.3 UCX-10-1.6
L = 4.0 UCX-10-3.2
L = 5.3 UCX-10-4.8

Schematic <Top View>



* Coil polarities, (+) and (-).

SCH-2A: High Density Double Coil Compact PCB Relay



This product uses two independently driven coils and is mainly used by manufacturers of probe cards for testing wafers for flash memory and RAM. Independently controlling the coils allows each contact point to switch different signals. This product is 0.2" (5.08mm) smaller than our SUH series.

Characteristics

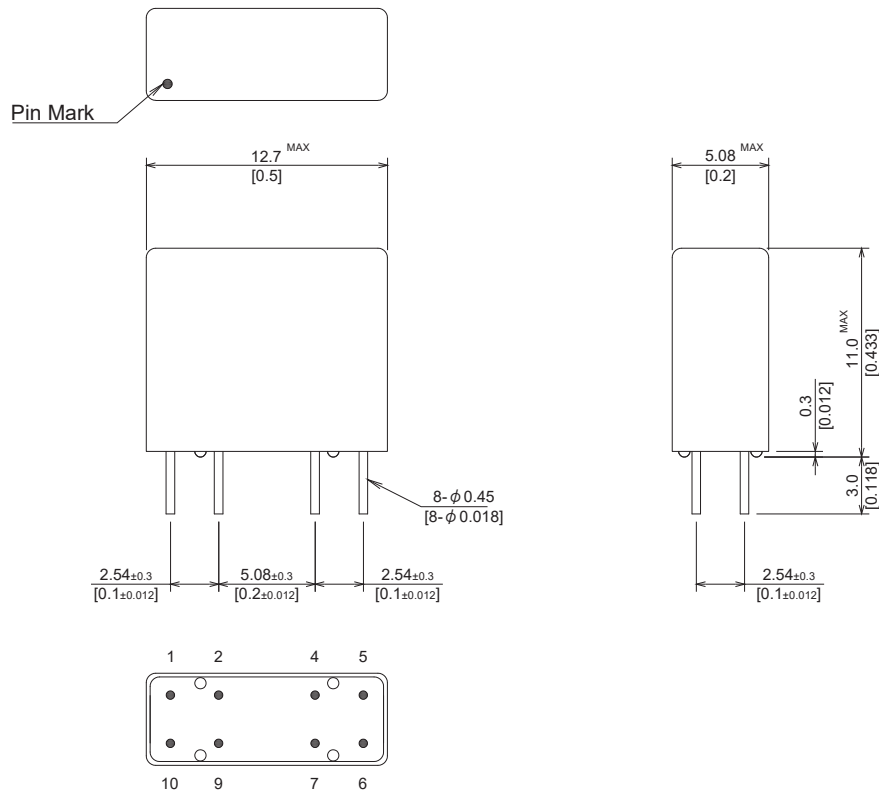
- Mount area: 12.7mm x 5.08mm
- Maximum contact rating: 10W
- Electrical lifespan: 300 million (@ 1V,10mA)



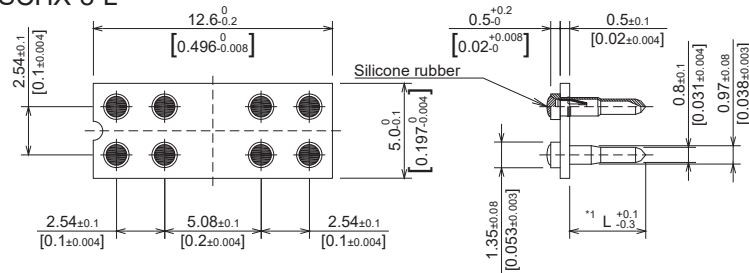
SCH 2A Series		SCH-2205G						
Contact Form		2 Form A (2 - 2)						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Units			
Coil Voltage	±10% @20°C @20°C @20°C		5.0	3.75	VDC			
Coil Resistance			160		Ω			
Must Operate					VDC			
Must Release			0.7		VDC			
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions		Min	Nom	Max	Units	
Switching Voltage		DC/Peak AC resistance		300		100	V	
Switching Current		DC/Peak AC resistance				0.5	A	
Carry Current		DC/Peak AC resistance(@30°C)				1.0	A	
Contact Rating		DC/Peak AC resistance				10	W	
Life Expectancy		at 1V 10mA					x10 ⁶ Cycle	
Contact Resistance		Maximum Initial Operete Voltage				150		mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage				5		mΩ
Insulation Resistance		Between Contacts		10 ¹¹		Ω		
		Contacts to Shield		10 ¹¹		Ω		
		Contacts to Coil		10 ¹¹		Ω		
		Shield to Coil		10 ¹¹		Ω		
		(at 100V 20°C 65%)						
Dielectric Strength (Static)		Between Contacts		200		VDC		
		Contacts to Shield		500		VDC		
		Contacts to Coil		500		VDC		
		Shield to Coil		500		VDC		
Operate Time (Including Bounce)		at Nominal Coil Voltage			0.35	msec		
		100Hz Square Wave						
Release Time		Diode Suppression			0.2	msec		
Measurement Reference Condition			Environmental Ratings					
Temp : 15°C to 35°C			Operate temp : -20°C to +80°C					
Humidity : 25% to 75%RH			Storage temp : -40°C to +85°C					
Atmospheric Pressure : 860 to 1060hpa			Vibration : 20G's to 2000Hz					
			Shock : 50G's					

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

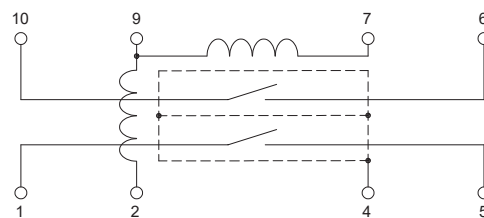


Relay Socket : SCHX-8-L



*1
 L = 3.2 SCHX-8-1.6
 L = 4.0 SCHX-8-3.2
 L = 5.3 SCHX-8-4.8

Schematic <Top View>



Contact
 Pin5 and Pin1 ON
 Pin6 and Pin10 ON

Coil
 Pin2 and Pin9 impress current
 Pin7 and Pin9 impress current

SUH-2A: High Density Double Coil Compact PCB Relay



This product uses two independently driven coils and is mainly used by manufacturers of probe cards for testing wafers for flash memory and RAM. Independently controlling the coils allows each contact point to switch different signals.

Characteristics

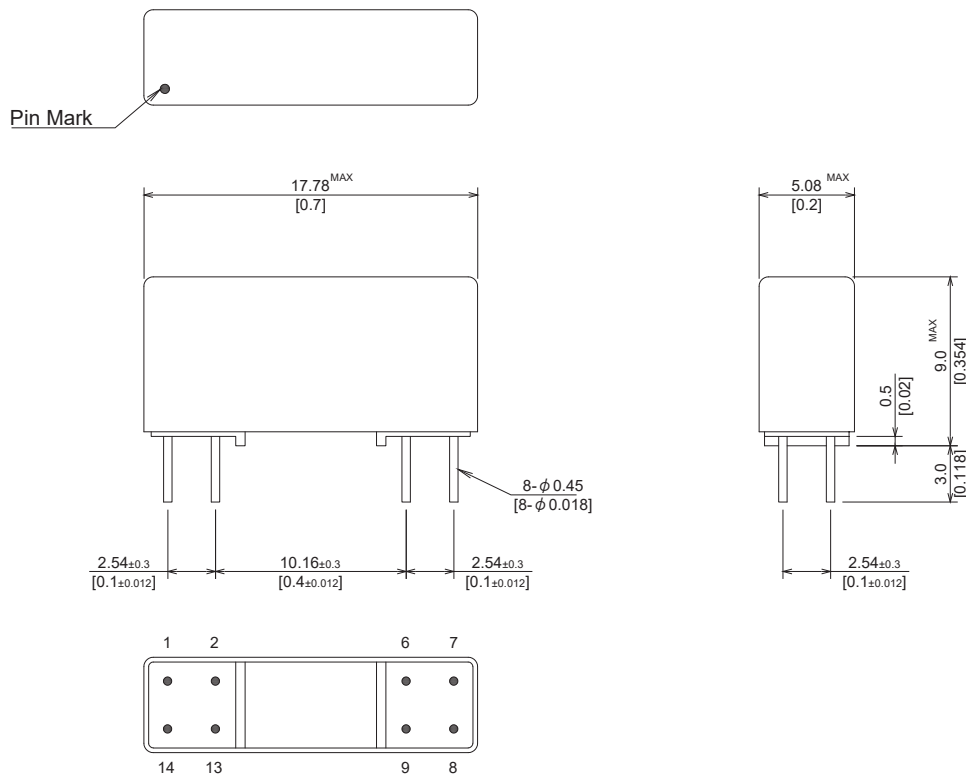
- Mount area: 17.78mm x 5.08mm
- Maximum contact rating: 10W
- Electrical lifespan: 1 billion (@ 1V,10mA)



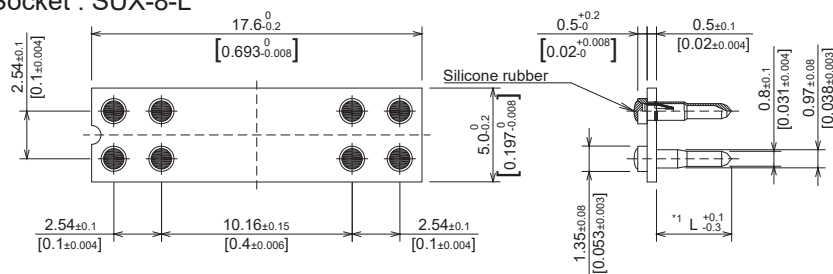
SUH 2A Series		SUH-2205G			SUH-2212G			
Contact Form		2 Form A (2 - 2)						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		200			600		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			1000			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹¹			Ω
		Contacts to Shield			10 ¹¹			Ω
		Contacts to Coil			10 ¹¹			Ω
		Shield to Coil			10 ¹¹			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			500			VDC
		Contacts to Coil			500			VDC
		Shield to Coil			500			VDC
Operate Time		at Nominal Coil Voltage					0.35	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.2	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

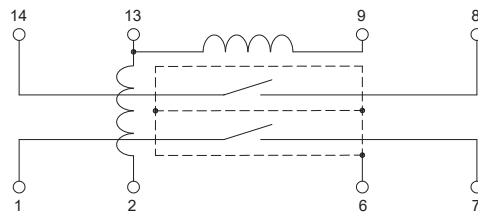


Relay Socket : SUX-8-L



*1 L = 3.3 SUX-8-1.6
L = 4.0 SUX-8-3.2
L = 5.3 SUX-8-4.8

Schematic <Top View>



Contact
Pin1 and Pin7 ON
Pin8 and Pin14 ON

Coil
Pin2 and Pin13 impress current
Pin9 and Pin13 impress current

UJ 1A J-Lead: Ultra-compact, High-frequency Relay



This product was designed to meet the high-density needs in industries such as ATE and communication measuring instruments. Compared to our CJ 1A high-frequency series, the mount area is reduced by 10%. In addition, these can support frequencies from DC to 8.0GHz, and are one of our products positioned to meet all variety of needs.

Characteristics

- Mount area: 7.95mm x 4.67mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{12}\Omega$
- Frequencies: Up to DC 8.0GHz

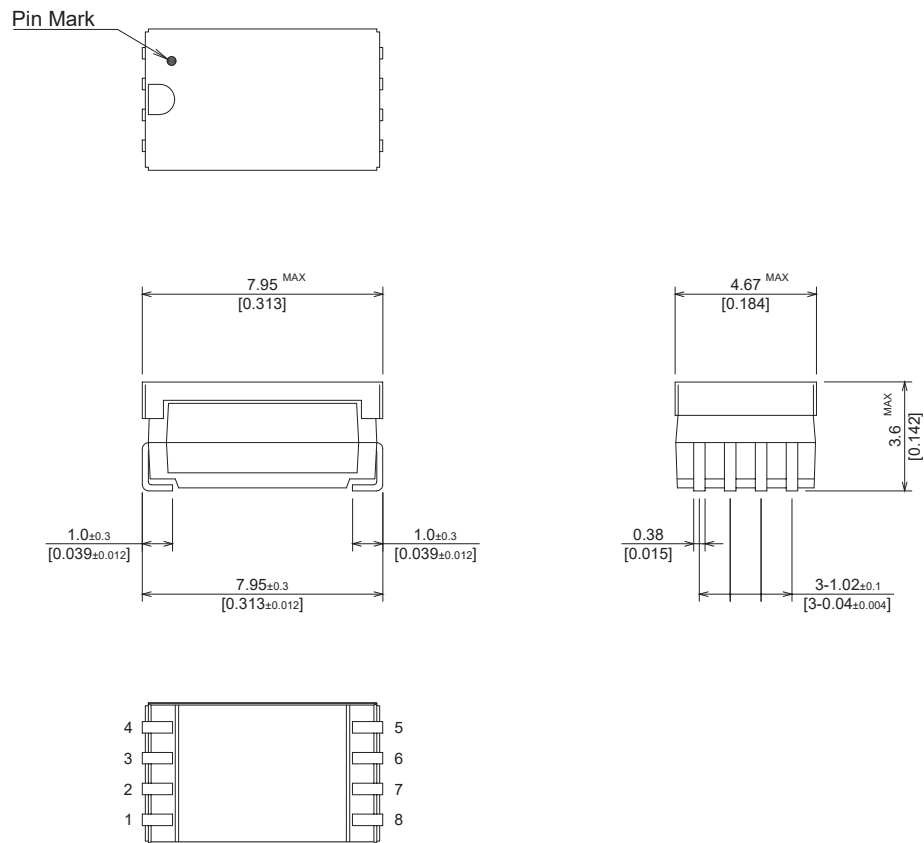


UJ 1A Series		UJ-103RF			UJ-105RF			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			3.3			5.0		VDC
Coil Resistance	±10% @20°C		90			150		Ω
Must Operate	@20°C			2.8			3.75	VDC
Must Release	@20°C	0.5			0.7			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.2	A
Carry Current		DC/Peak AC resistance(@30°C)					0.2	A
Contact Rating		DC/Peak AC resistance					3	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					200	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹²			Ω
		Contacts to Shield			10 ¹²			Ω
		Contacts to Coil			10 ¹²			Ω
		Shield to Coil (at 100V 20°C 65%)			10 ¹²			Ω
Dielectric Strength		Between Contacts			150			VDC
(Static)		Contacts to Shield			500			VDC
		Contacts to Coil			500			VDC
		Shield to Coil			500			VDC
Operate Time		at Nominal Coil Voltage					0.25	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.05	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		
				Processing Temp : 260°C max for 60sec. dwell time.				

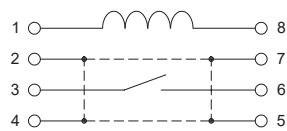
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

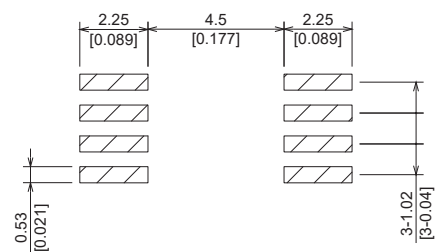
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



Land Pattern Recommendation



CJ 1A J-Lead: Ultra-compact, High-frequency SMT Relay



This product was developed to improve upon the frequency characteristics of DC to 4.0GHz and the 1.6Gbps transmission in our existing CJ series. Frequency characteristics were improved to DC to 7.0GHz with the ability to reliably transmit signals at 3.2Gbps.

Characteristics

- Mount area: 9.1mm x 4.67mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 7.0GHz

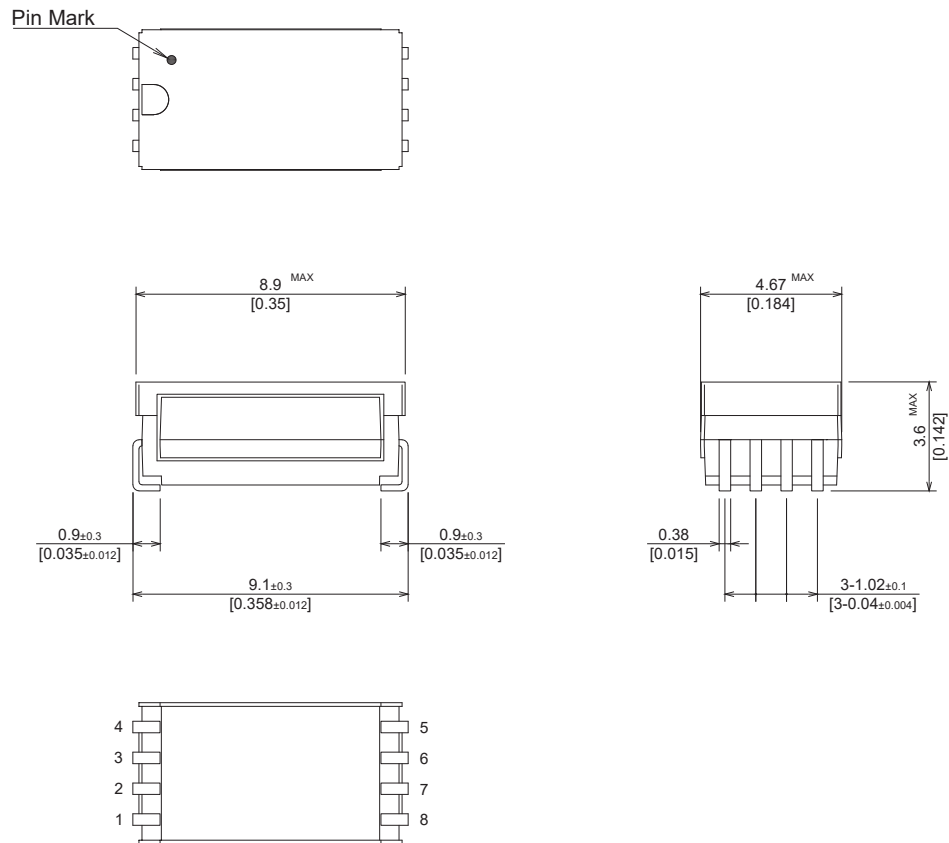


CJ 1A Series		CJ-E103RF			CJ-E105RF				
Contact Form		1 Form A							
Coil Specifications									
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units	
Coil Voltage	±10% @20°C @20°C @20°C @20°C		3.3			5.0		VDC	
Coil Resistance			90			150		Ω	
Must Operate				2.8			3.75	VDC	
Must Release			0.5		0.7			VDC	
Contact Ratings / Product Specifications									
Test Parameters		Test Conditions				Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance				300		100	V
Switching Current		DC/Peak AC resistance						0.5	A
Carry Current		DC/Peak AC resistance(@30°C)						1.0	A
Contact Rating		DC/Peak AC resistance						10	W
Life Expectancy		at 1V 10mA							x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage				150	mΩ		
Contact Resistance Stability		Maximum Initial Operete Voltage				5	mΩ		
Insulation Resistance		Between Contacts				10 ¹¹		Ω	
		Contacts to Shield				10 ¹¹		Ω	
		Contacts to Coil				10 ¹¹		Ω	
		Shield to Coil (at 100V 20°C 65%)				10 ¹¹		Ω	
Dielectric Strength (Static)		Between Contacts				200		VDC	
		Contacts to Shield				250		VDC	
		Contacts to Coil				250		VDC	
		Shield to Coil				250		VDC	
Operate Time (Including Bounce)		at Nominal Coil Voltage 100Hz Square Wave						0.3	msec
Release Time		Diode Suppression						0.05	msec
Measurement Reference Condition				Environmental Ratings					
Temp : 15°C to 35°C				Operate temp : -20°C to +80°C					
Humidity : 25% to 75%RH				Storage temp : -40°C to +85°C					
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz					
				Shock : 50G's					
				Processing Temp : 260°C max for 60sec. dwell time.					

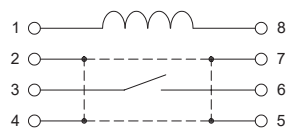
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

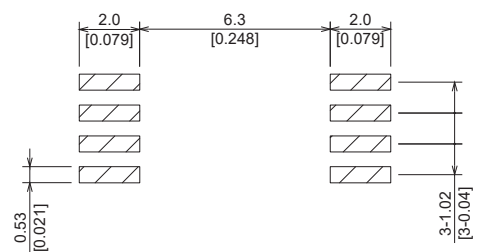
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



Land Pattern Recommendation



MG 1A Gull Wing: Compact, High-frequency SMT Relay



This product was developed to improve upon the frequency characteristics of DC to 4.0GHz and the 1.6Gbps transmission in our existing MJ series. The MG/MJ series shape was kept completely the same while frequency was improved to DC to 6.0GHz with reliable transmission at 3.2Gbps.

Characteristics

- Mount area: 12.7mm x 4.67mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{12}\Omega$
- Frequencies: Up to DC 6.0GHz

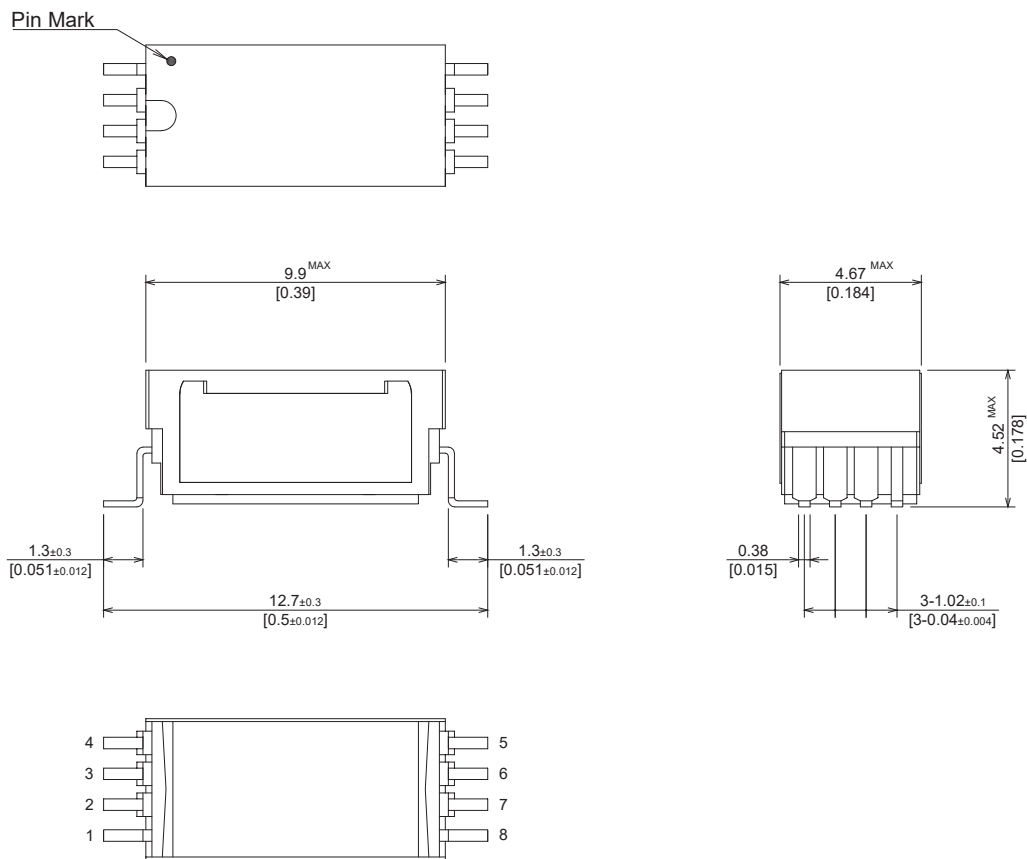


MG 1A Series		MG-E105H-64					
Contact Form		1 Form A					
Coil Specifications							
Parameters	Conditions	Min	Nom	Max	Units		
Coil Voltage			5.0		VDC		
Coil Resistance	±10% @20°C		200		Ω		
Must Operate	@20°C			3.75	VDC		
Must Release	@20°C	0.7			VDC		
Contact Ratings / Product Specifications							
Test Parameters		Test Conditions		Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance				100	V
Switching Current		DC/Peak AC resistance				0.5	A
Carry Current		DC/Peak AC resistance(@30°C)				1.0	A
Contact Rating		DC/Peak AC resistance				10	W
Life Expectancy		at 1V 10mA		300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage				150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage				5	mΩ
Insulation Resistance		Between Contacts		10 ¹²			Ω
		Contacts to Shield		10 ¹²			Ω
		Contacts to Coil		10 ¹²			Ω
		Shield to Coil		10 ¹²			Ω
		(at 100V 20°C 65%)					
Dielectric Strength (Static)		Between Contacts		200			VDC
		Contacts to Shield		250			VDC
		Contacts to Coil		250			VDC
		Shield to Coil		250			VDC
Operate Time (Including Bounce)		at Nominal Coil Voltage 100Hz Square Wave				0.3	msec
Release Time		Diode Suppression				0.05	msec
Measurement Reference Condition			Environmental Ratings				
Temp : 15°C to 35°C			Operate temp : -20°C to +80°C				
Humidity : 25% to 75%RH			Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa			Vibration : 20G's to 2000Hz				
			Shock : 50G's				
			Processing Temp : 260°C max for 60sec. dwell time.				

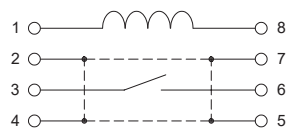
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

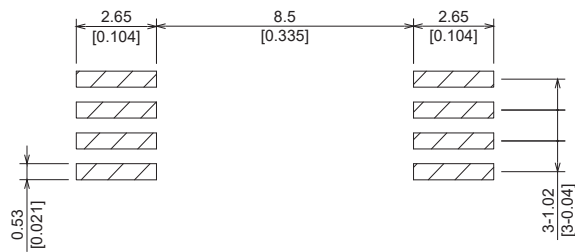
* Pin mark (●) corresponds to the terminal number 1.



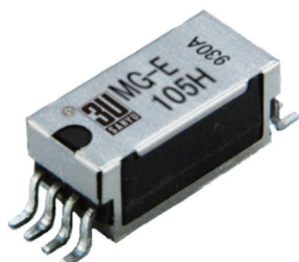
Schematic <Top View>



Land Pattern Recommendation



MG 1A Gull Wing: Compact SMT Relay



This product was developed as an even smaller version of our MSG series. This series offers a 38% reduction in mount area compared to our MSG series. Since announcing this product, it has been a long-term bestseller as the industry standard for relays used in semiconductor automatic test equipment (ATE). This relay solves a variety of needs by combining both the properties and reliability required in the ATE industry.

Characteristics

- Mount area: 12.7mm x 4.67mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 4.0GHz

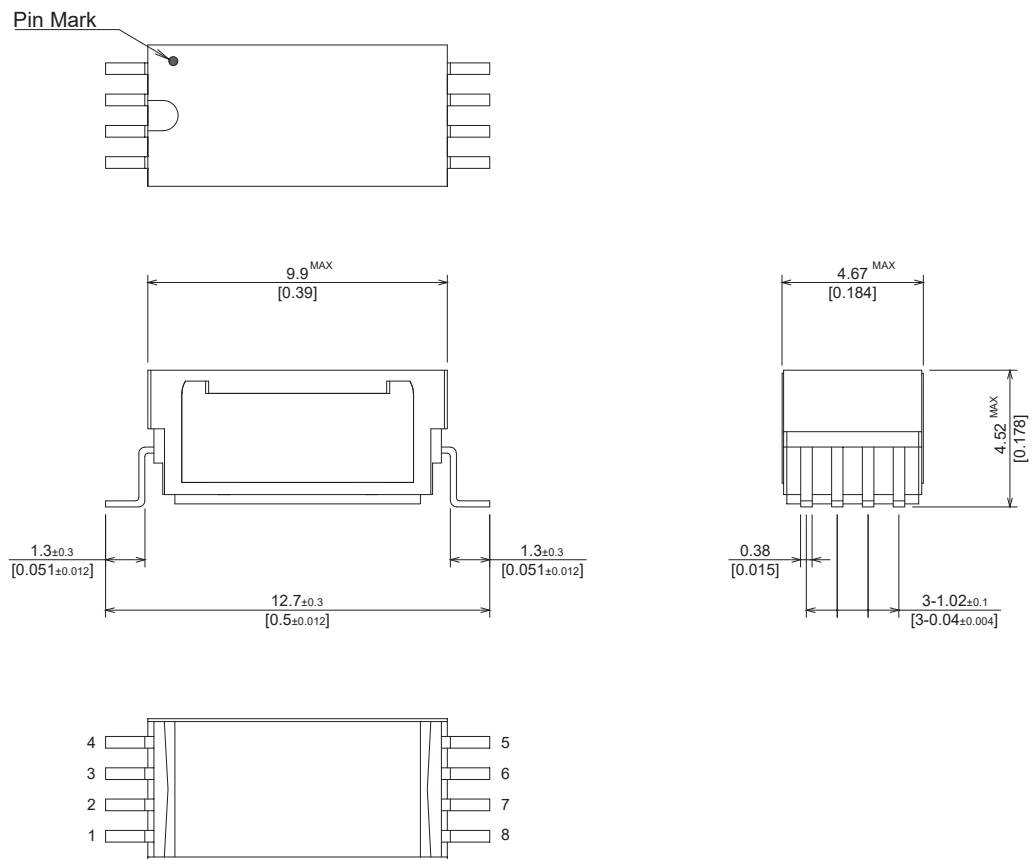


MG 1A Series		MG-E105H			MG-E112H			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		150			500		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹¹			Ω
		Contacts to Shield			10 ¹¹			Ω
		Contacts to Coil			10 ¹¹			Ω
		Shield to Coil			10 ¹¹			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			250			VDC
		Contacts to Coil			250			VDC
		Shield to Coil			250			VDC
Operate Time		at Nominal Coil Voltage					0.3	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.05	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		
				Processing Temp : 260°C max for 60sec. dwell time.				

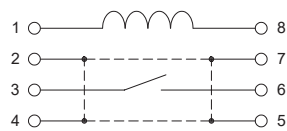
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

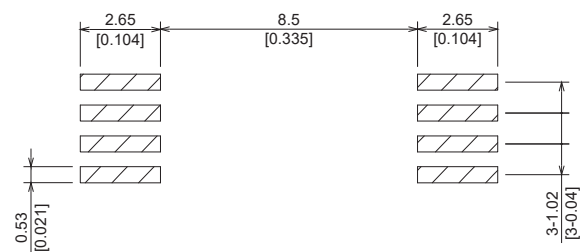
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



Land Pattern Recommendation



MJ 1A J-Lead: Compact SMT Relay



This product was developed as an even smaller version of our MSG series. This series offers a 38% reduction in mount area compared to our MSG series. Since announcing this product, it has been a long-term bestseller as the industry standard for relays used in ATE. This relay solves a variety of needs by combining both the properties and reliability required in the ATE industry.

Characteristics

- Mount area: 10.16mm x 4.67mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 4.0GHz

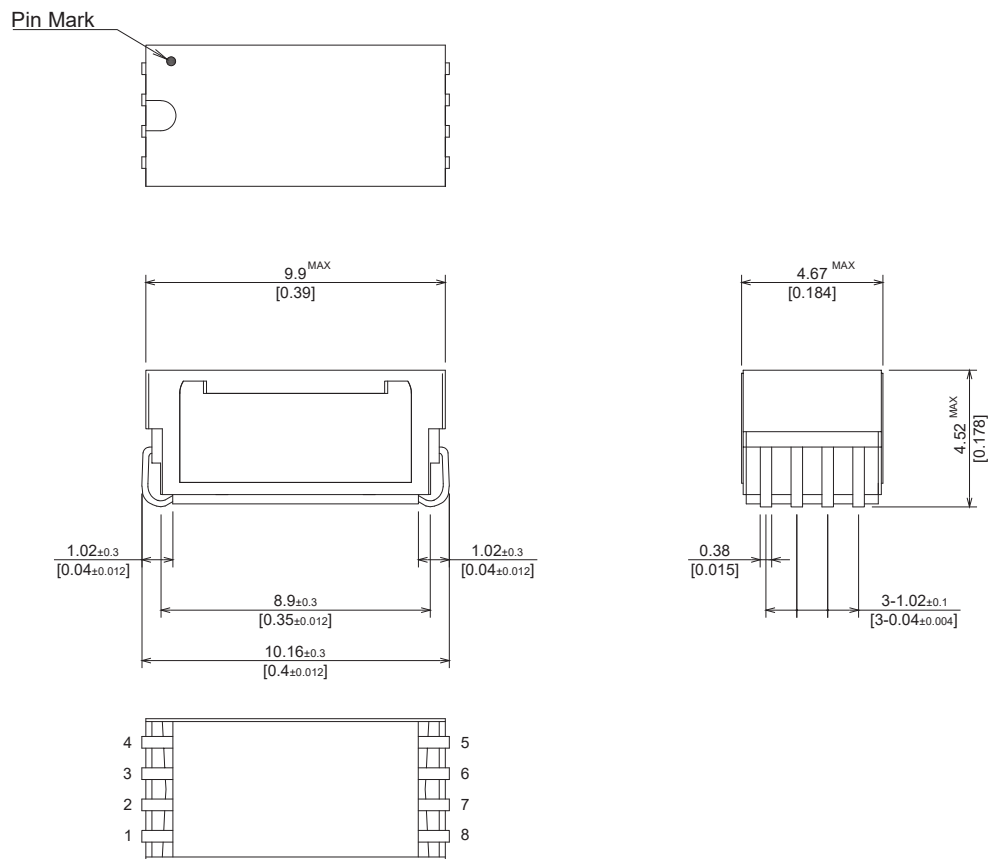


MJ 1A Series		MJ-E105H			MJ-E112H			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		150			500		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					100	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A
Contact Rating		DC/Peak AC resistance					10	W
Life Expectancy		at 1V 10mA			300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹¹			Ω
		Contacts to Shield			10 ¹¹			Ω
		Contacts to Coil			10 ¹¹			Ω
		Shield to Coil			10 ¹¹			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			200			VDC
(Static)		Contacts to Shield			250			VDC
		Contacts to Coil			250			VDC
		Shield to Coil			250			VDC
Operate Time		at Nominal Coil Voltage					0.3	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.05	msec
Measurement Reference Condition				Environmental Ratings				
Temp : 15°C to 35°C				Operate temp : -20°C to +80°C				
Humidity : 25% to 75%RH				Storage temp : -40°C to +85°C				
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz				
				Shock : 50G's				
				Processing Temp : 260°C max for 60sec. dwell time.				

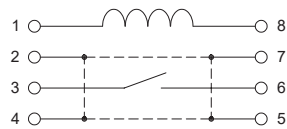
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

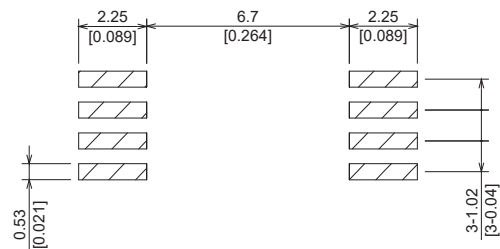
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



Land Pattern Recommendation



MSG 1A Gull Wing: High Contact Capacity SMT Relay



This product was developed with the aim of increasing the industry standard maximum contact capacity of 10W to 30W. The maximum contact capacity was increased to 30W, improving the operating switching voltage to 200VDC, with an electrical lifespan of over 1.5 billion cycles. This resulted in a great improvement in solving load-related needs. In addition to the properties and reliability needed for ATE industry, this product is also suitable for DC characteristic testing.

Characteristics

- Mount area: 20.4mm x 4.5mm
- Electrical lifespan: 1.5 billion (@ 1V 10mA)
- Max switching voltage: 200VDC
- Dielectric strength: 300VDC
- Frequencies: Up to DC 2.5GHz

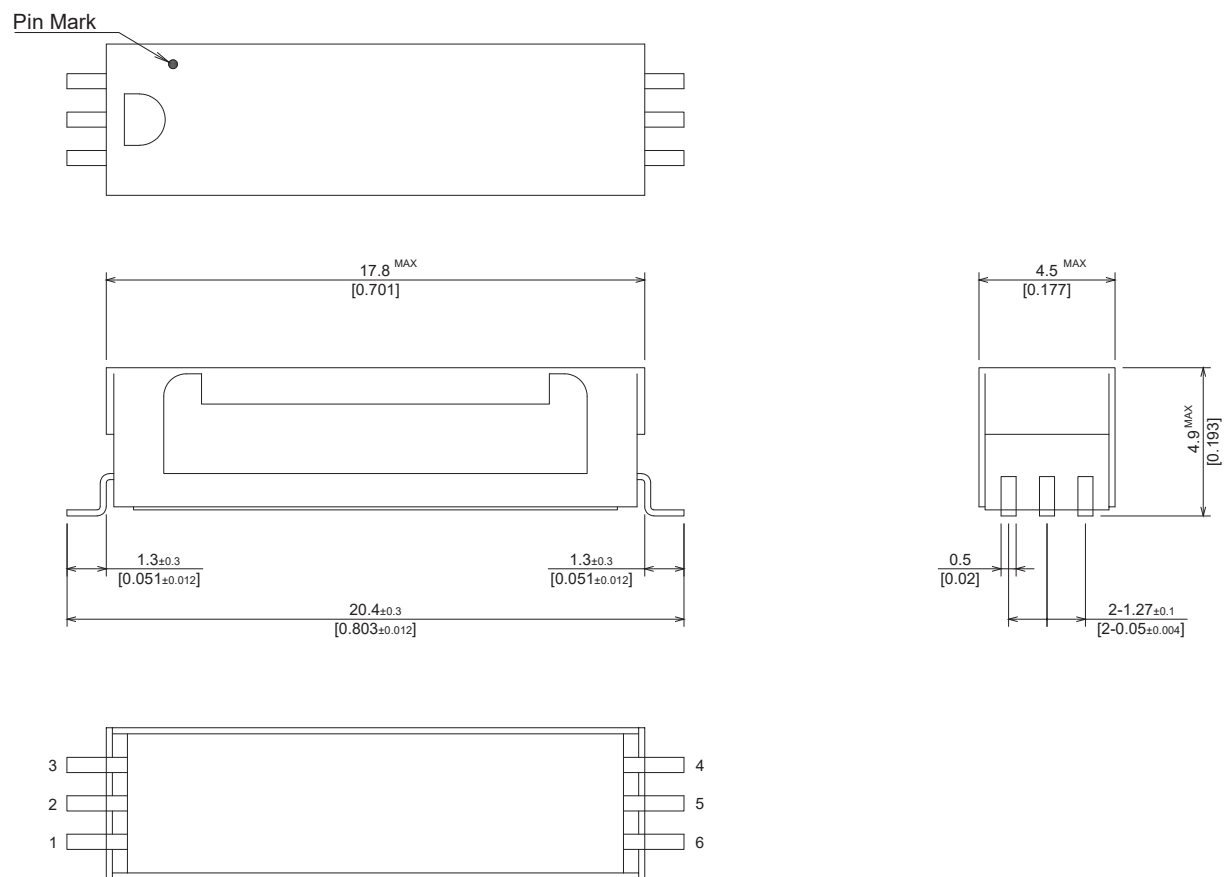


MSG 1A Series		MSG-105AK3H			MSG-112AK3H			
Contact Form		1 Form A						
Coil Specifications								
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			5.0			12.0		VDC
Coil Resistance	±10% @20°C		160			600		Ω
Must Operate	@20°C			3.75			8.8	VDC
Must Release	@20°C	0.7			1.2			VDC
Contact Ratings / Product Specifications								
Test Parameters		Test Conditions			Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance					200	V
Switching Current		DC/Peak AC resistance					0.5	A
Carry Current		DC/Peak AC resistance(@30°C)					1.3	A
Contact Rating		DC/Peak AC resistance					30	W
Life Expectancy		at 1V 10mA			1500			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage					150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5	mΩ
Insulation Resistance		Between Contacts			10 ¹¹			Ω
		Contacts to Shield			10 ¹¹			Ω
		Contacts to Coil			10 ¹¹			Ω
		Shield to Coil			10 ¹¹			Ω
		(at 100V 20°C 65%)						
Dielectric Strength		Between Contacts			300			VDC
(Static)		Contacts to Shield			500			VDC
		Contacts to Coil			500			VDC
		Shield to Coil			500			VDC
Operate Time		at Nominal Coil Voltage					0.5	msec
(Including Bounce)		100Hz Square Wave						
Release Time		Diode Suppression					0.2	msec
Measurement Reference Condition				Environmental Ratings				
Temp		: 15°C to 35°C		Operate temp		: -20°C to +80°C		
Humidity		: 25% to 75%RH		Storage temp		: -40°C to +85°C		
Atmospheric Pressure		: 860 to 1060hpa		Vibration		: 20G's to 2000Hz		
				Shock		: 50G's		
				Processing Temp : 260°C max for 60sec. dwell time.				

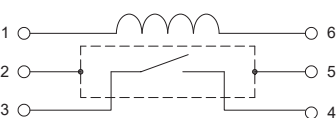
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

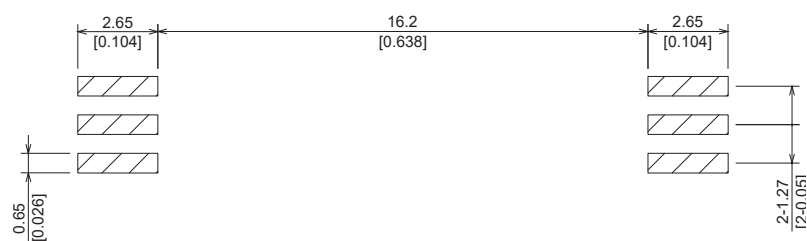
* Pin mark (●) corresponds to the terminal number 1.



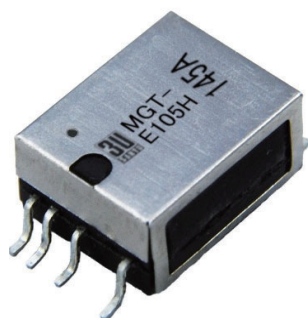
Schematic <Top View>



Land Pattern Recommendation



MGT 1A1B Gull Wing: Compact SMT Relay



This product uses two make switches to create a transfer switch (1A+1B), thereby improving lifespan and reliability. Using make contact extends the lifespan and achieving high reliability. This product is therefore highly valued in ATE and measurement equipment industries.

Characteristics

- Mount area: 12.7mm x 7.62mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 3.5GHz

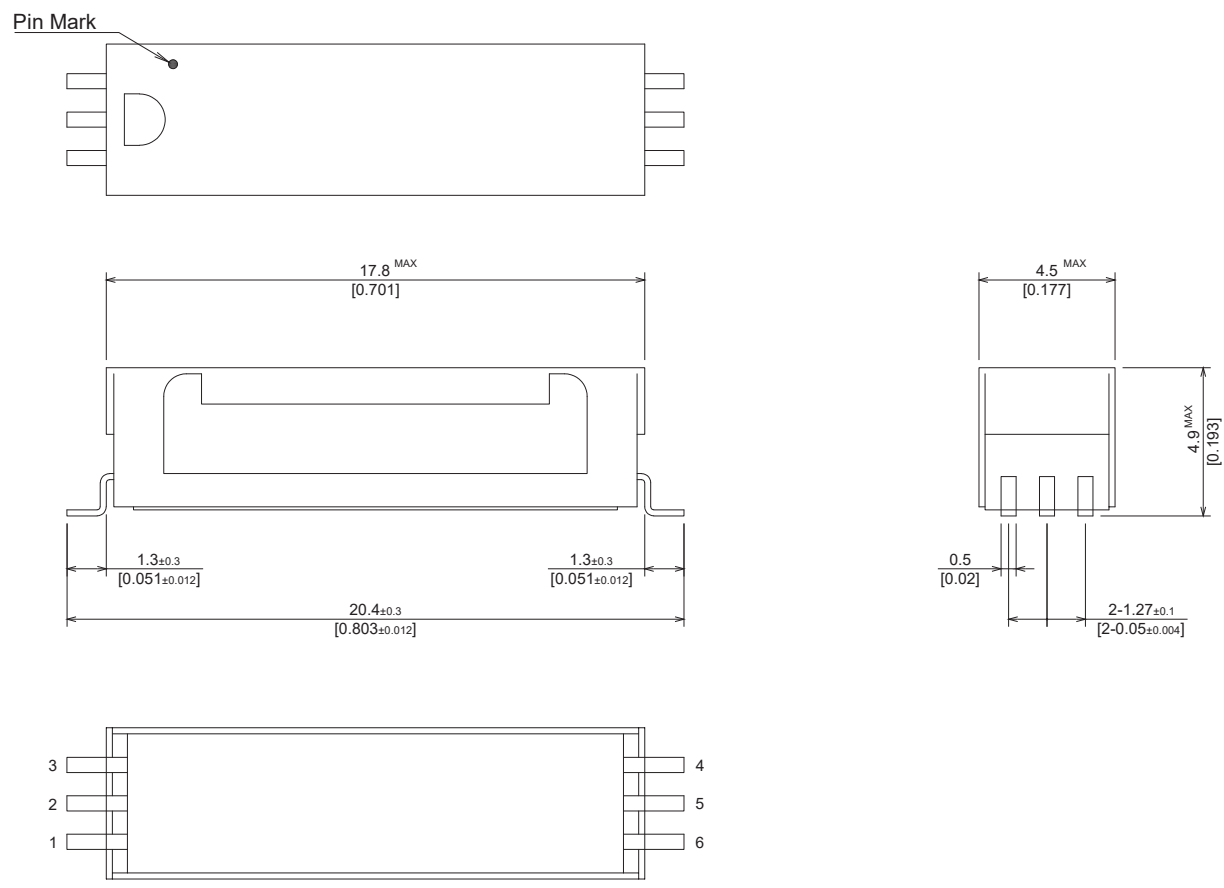


MGT 1A1B Series		MGT-E103H			MGT-E105H			MGT-E112H			
Contact Form		1 Form C (A + B)									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			3.3	3.6		5.0	5.5		12.0	13.2	VDC
Coil Resistance	±10% @20°C		70			110			550		Ω
Must Operate	@20°C			2.8			3.75			8.8	VDC
Must Release	@20°C	0.5			0.7			1.2			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								100	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹¹			Ω
		Contacts to Shield						10 ¹¹			Ω
		Contacts to Coil						10 ¹¹			Ω
		Shield to Coil						10 ¹¹			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield						250			VDC
		Contacts to Coil						250			VDC
		Shield to Coil						250			VDC
Operate Time		at Nominal Coil Voltage								0.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								0.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						
					Processing Temp : 260°C max for 60sec. dwell time.						

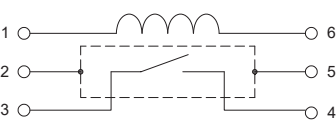
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

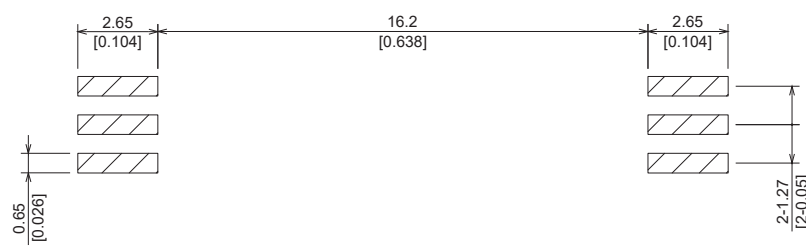
* Pin mark (●) corresponds to the terminal number 1.



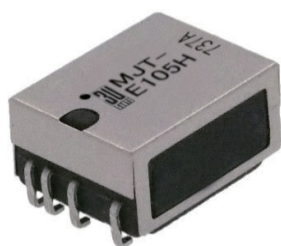
Schematic <Top View>



Land Pattern Recommendation



MJT 1A1B J-Lead: Compact SMT Relay



This product uses two make switches to create a transfer switch (1A+1B), thereby improving lifespan and reliability. Using make contact extends the lifespan and achieving high reliability. This product is therefore highly valued in ATE and measurement equipment industries.

Characteristics

- Mount area: 10.8mm x 7.62mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 3.5GHz

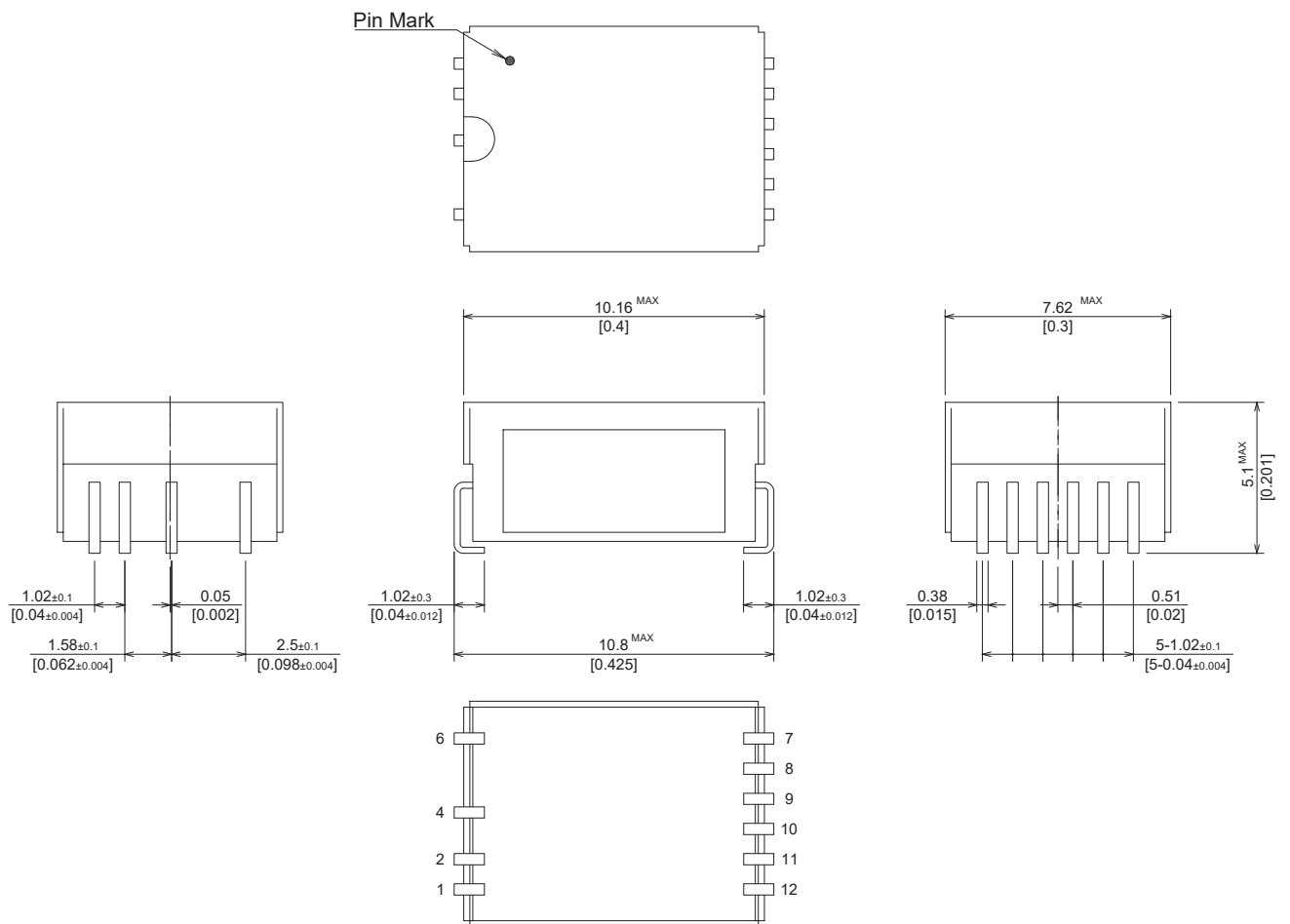


MJT 1A1B Series		MJT-E103H			MJT-E105H			MJT-E112H			
Contact Form		1 Form C (A + B)									
Coil Specifications											
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Units
Coil Voltage			3.3	3.6		5.0	5.5		12.0	13.2	VDC
Coil Resistance	±10% @20°C		70			110			550		Ω
Must Operate	@20°C			2.8			3.75			8.8	VDC
Must Release	@20°C	0.5			0.7			1.2			VDC
Contact Ratings / Product Specifications											
Test Parameters		Test Conditions						Min	Nom	Max	Units
Switching Voltage		DC/Peak AC resistance								100	V
Switching Current		DC/Peak AC resistance								0.5	A
Carry Current		DC/Peak AC resistance(@30°C)								1.0	A
Contact Rating		DC/Peak AC resistance								10	W
Life Expectancy		at 1V 10mA						300			x10 ⁶ Cycle
Contact Resistance		Maximum Initial Operete Voltage								150	mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage								5	mΩ
Insulation Resistance		Between Contacts						10 ¹¹			Ω
		Contacts to Shield						10 ¹¹			Ω
		Contacts to Coil						10 ¹¹			Ω
		Shield to Coil						10 ¹¹			Ω
		(at 100V 20°C 65%)									
Dielectric Strength		Between Contacts						200			VDC
(Static)		Contacts to Shield						250			VDC
		Contacts to Coil						250			VDC
		Shield to Coil						250			VDC
Operate Time		at Nominal Coil Voltage								0.5	msec
(Including Bounce)		100Hz Square Wave									
Release Time		Diode Suppression								0.5	msec
Measurement Reference Condition					Environmental Ratings						
Temp : 15°C to 35°C					Operate temp : -20°C to +60°C						
Humidity : 25% to 75%RH					Storage temp : -40°C to +85°C						
Atmospheric Pressure : 860 to 1060hpa					Vibration : 20G's to 2000Hz						
					Shock : 50G's						
					Processing Temp : 260°C max for 60sec. dwell time.						

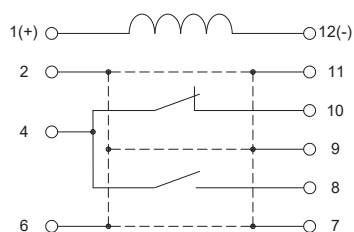
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

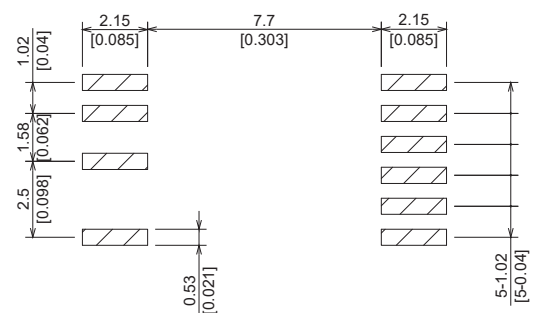
* Pin mark (●) corresponds to the terminal number 1.



Schematic <Top View>



Land Pattern Recommendation



* Coil polarities (+) and (-)

MJ 2A2B J-Lead: Compact SMT Relay



This product was developed for use in differential circuits for ATE and semiconductor inspection boards. This product consists of two transfer switches (1A+1B) in one package. As a result, compared to using two of our MGT/MJT relays, this relay reduces mount area by 25%. In addition, the electrical life is guaranteed to 300 million cycles (equivalent to a make switch) and it also supports frequencies up to DC 4.0GHz.

Characteristics

- Mount area: 10.3mm x 11.3mm
- Electrical lifespan: 300 million (@ 1V 10mA)
- Insulation resistance: $\geq 10^{11}\Omega$
- Frequencies: Up to DC 4.0GHz

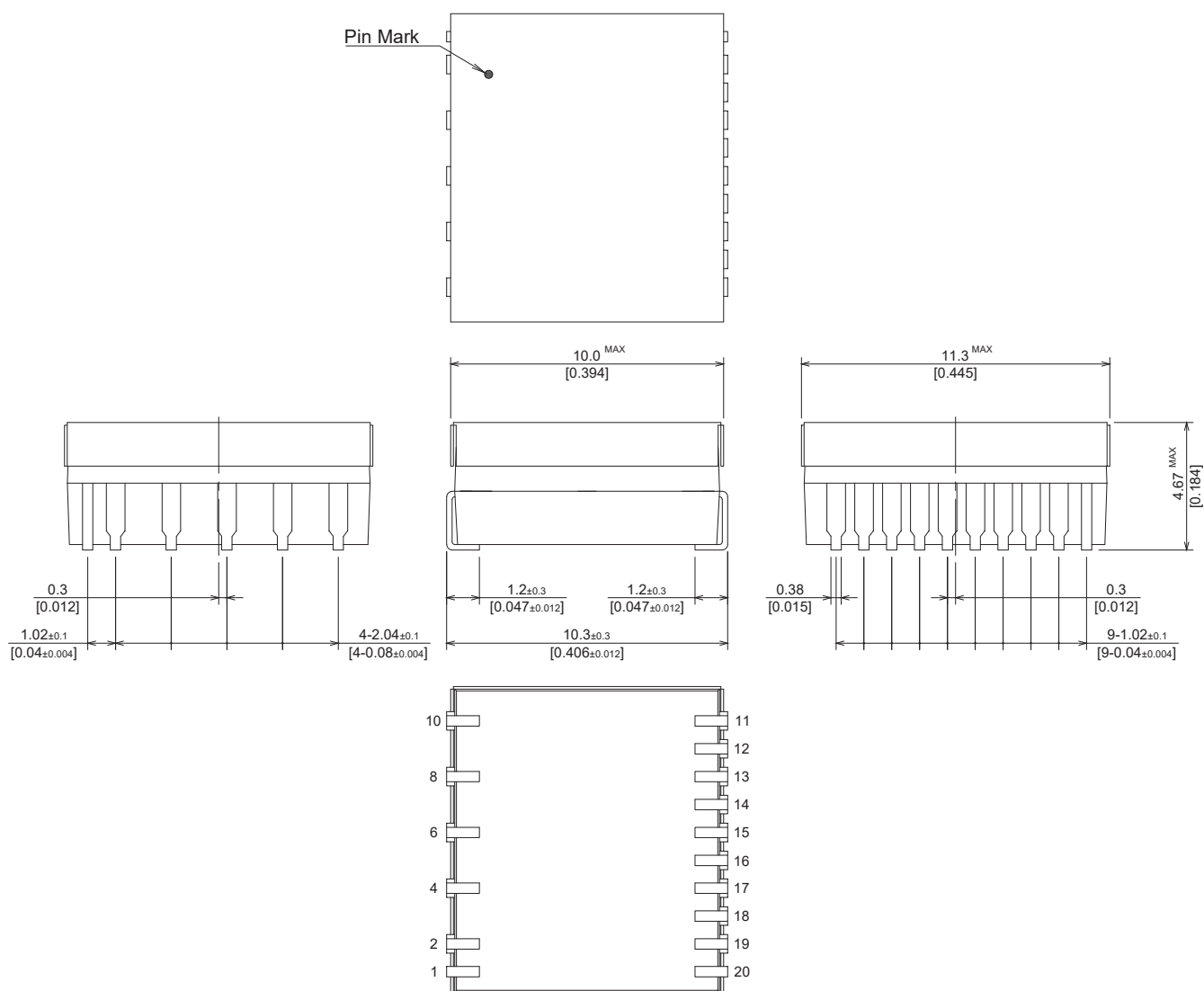


MJ 2A2B Series		MJ-E2T05N			MJ-E2T12N				
Contact Form		2 Form C (A + B)							
Coil Specifications									
Parameters	Conditions	Min	Nom	Max	Min	Nom	Max	Units	
Coil Voltage	±10% @20°C @20°C @20°C @20°C		5.0	5.5		12.0	13.2	VDC	
Coil Resistance			110			550		Ω	
Must Operate				3.75			8.8	VDC	
Must Release			0.7		1.2			VDC	
Contact Ratings / Product Specifications									
Test Parameters		Test Conditions			Min	Nom	Max	Units	
Switching Voltage		DC/Peak AC resistance			300		100	V	
Switching Current		DC/Peak AC resistance					0.5	A	
Carry Current		DC/Peak AC resistance(@30°C)					1.0	A	
Contact Rating		DC/Peak AC resistance					10	W	
Life Expectancy		at 1V 10mA						x10 ⁶ Cycle	
Contact Resistance		Maximum Initial Operete Voltage					180		mΩ
Contact Resistance Stability		Maximum Initial Operete Voltage					5		mΩ
Insulation Resistance		Between Contacts			10 ¹¹		Ω		
		Contacts to Shield			10 ¹¹		Ω		
		Contacts to Coil			10 ¹¹		Ω		
		Shield to Coil			10 ¹¹		Ω		
		(at 100V 20°C 65%)							
Dielectric Strength (Static)		Between Contacts			200		VDC		
		Contacts to Shield			250		VDC		
		Contacts to Coil			250		VDC		
		Shield to Coil			250		VDC		
Operate Time (Including Bounce)		at Nominal Coil Voltage					0.3	msec	
		100Hz Square Wave							
Release Time		Diode Suppression					0.3	msec	
Measurement Reference Condition				Environmental Ratings					
Temp : 15°C to 35°C				Operate temp : -20°C to +60°C					
Humidity : 25% to 75%RH				Storage temp : -40°C to +85°C					
Atmospheric Pressure : 860 to 1060hpa				Vibration : 20G's to 2000Hz					
				Shock : 50G's					
				Processing Temp : 260°C max for 60sec. dwell time.					

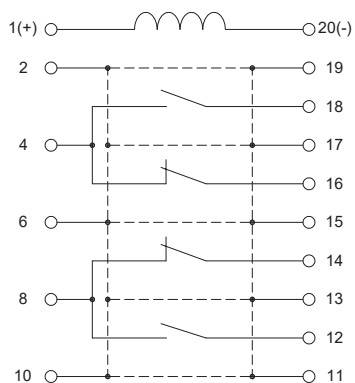
★ For reel packaged version, see p 85.

Dimensions < All Dimensions are mm [inch] >

* Pin mark (●) corresponds to the terminal number 1.

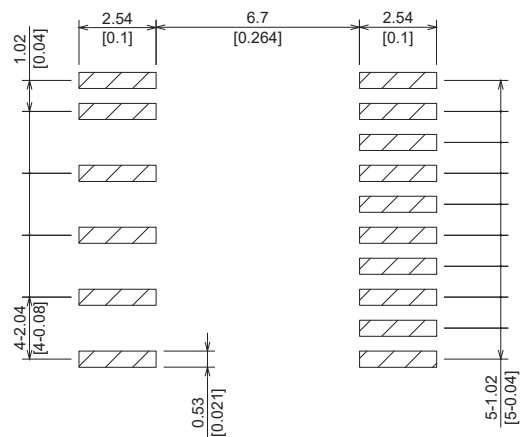


Schematic <Top View>



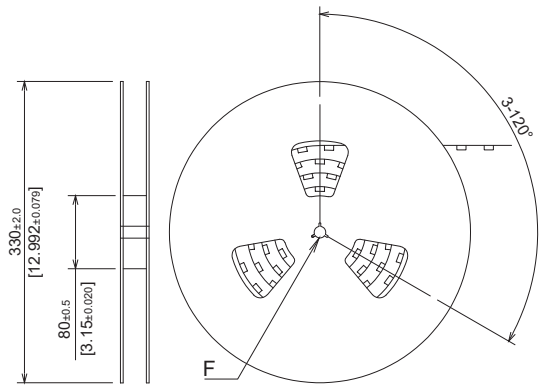
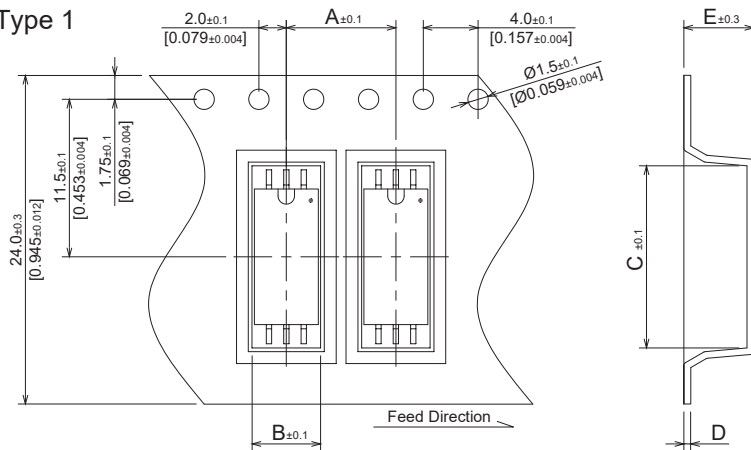
* Coil polarities (+) and (-)

Land Pattern Recommendation



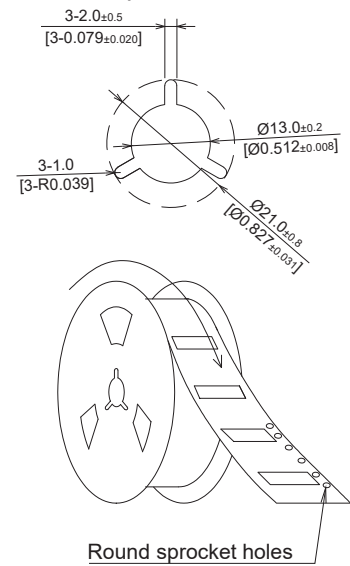
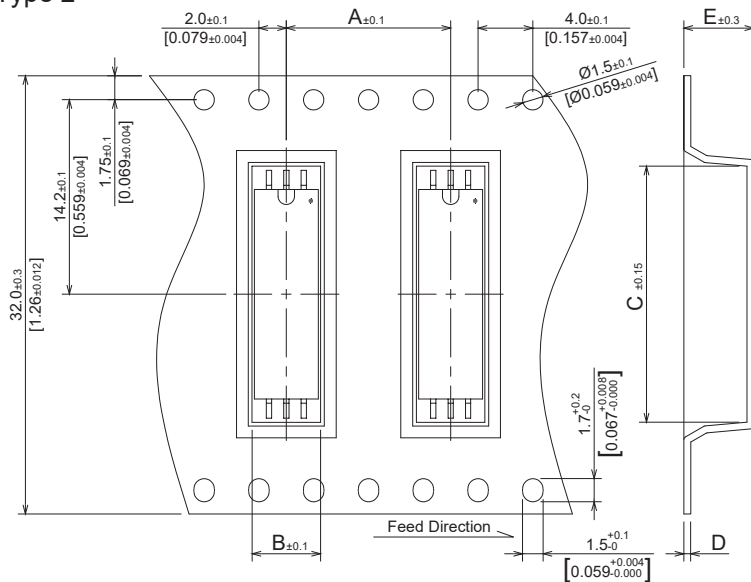
Dimensions of Tape and Reel < All Dimensions are mm [inch] >

Type 1



Details of the part F

Type 2



Packing conforms to EIA standard EIA-481-2 or EIA-481-3

Dimensions value detail and Packing Quantity

Model Name	Type	A		B		C		D		E		SPQ
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
UJ-1xxRF	1	8.0	0.315	4.9	0.193	8.5	0.335	0.5	0.020	4.4	0.173	2,000
CJ-E1xxRF	1	12.0	0.472	4.9	0.193	9.4	0.370	0.4	0.016	4.3	0.169	1,000
MG-E105H-64	1	12.0	0.472	5.0	0.197	13.3	0.524	0.5	0.020	5.1	0.201	1,000
MG-E1xx	1	12.0	0.472	5.0	0.197	13.3	0.524	0.5	0.020	5.1	0.201	1,000
MJ-E1xx	1	12.0	0.472	4.9	0.193	11.0	0.433	0.4	0.016	5.5	0.217	1,000
MSG-1xxAK3H	2	12.0	0.472	4.9	0.193	20.8	0.819	0.5	0.020	5.4	0.213	1,000
MGT-E1xxH	1	12.0	0.472	8.0	0.315	13.1	0.516	0.5	0.020	5.7	0.224	500
MJT-E1xxH	1	12.0	0.472	8.3	0.327	11.0	0.433	0.5	0.020	5.9	0.232	500
MJ-E2TxxN	1	16.0	0.630	11.6	0.457	10.6	0.417	0.5	0.020	5.5	0.217	500

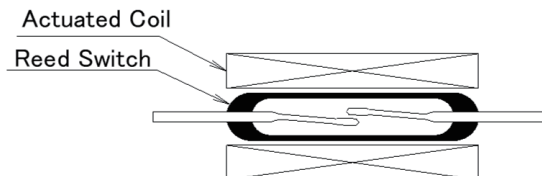
NOTE

Overview of Reed Relays

1) What are reed relays

A reed relay is based around a reed switch. A reed switch contains two ferromagnetic reeds sealed inside a glass tube facing each other with a small gap between them. The glass tube is filled with an inert gas to prevent the contacts from being activated, and the contacts are plated with a special metal.

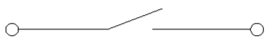
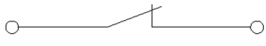
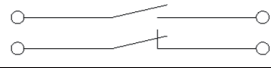
The relay opens and closes the contacts by moving the switch reeds with the magnetic force generated from a coil wound around the glass tube of the switch.



2) Comparison of reed relays and other relays

Item	R e e d R e l a y	M e c h a n i c a l (h i n g e d) R e l a y	M e c h a n i c a l (p l u n g e r) R e l a y	S S R	O p t i c a l M O S
Appearance	⊙	⊙	△	○	⊙
Number of contact poles	○	○	⊙	△	△
Power consumption	○	○	△	⊙	⊙
Response speed	○	△	△	⊙	○
Contact reliability	○	△	△	⊙	⊙
Bounce	○	△	△	⊙	⊙
Insulation	○	○	⊙	△	○
Durability	○	○	△	⊙	⊙
Transient response	⊙	⊙	⊙	△	△
Operation noise	○	△	△	⊙	⊙
Vibration and shock resistance	△	△	△	⊙	⊙
Surrounding environment	○	△	△	○	⊙
Contact resistance	⊙	⊙	⊙	△	△
Current leakage	⊙	⊙	⊙	△	○
Opening and closing capacity	○	○	⊙	⊙	△

3) Terminology

Terms	Explanation		
		Non-operating state	Operating state
1 Contact types	Form A (1 make)		
	Form B (1 break)		
	Form C (transfer)		
	Form C (A+B) (make-break)		
	Form (A+B) (make-break)		
2 Rated voltage	This is the specified voltage that is applied to the coil to operate the relay. The allowable fluctuation of the rated voltage is within $\pm 10\%$ (at 20°C).		
3 Coil resistance	The coil resistance of the relay is expressed in Ω .		
4 Operate voltage	This is the minimum coil voltage required to operate the relay. For example, if a voltage of 3.3V is applied to a relay with an operating voltage of 3.75V, it will not operate.		
5 Release voltage	This is the coil voltage required to return an activated relay to a deactivated state. For example, if a voltage of 0.5V is applied to a relay with a release voltage of 1.2V, it will assume a deactivated state. If a voltage of 1.5V is applied, it will not assume a deactivated state.		
6 Maximum switching voltage	This is the max voltage (at 1mA) that can open/close the contacts when a load is connected. ("peak voltage value" for AC) However, please use within the maximum contact capacity (see 9. below). Using a voltage that exceeds the maximum switching voltage may cause the contacts to melt or accelerate deterioration.		
7 Maximum switching current	This is the max current that can open/close the contacts when a load is connected to the contacts. ("peak current value" for AC) However, please use within the maximum contact capacity (see 9. below). Using a current that exceeds the maximum switching current may cause the contacts to melt or accelerate deterioration.		
8 Maximum carry current	This is the maximum current that can flow continuously after the contacts are closed. When opening the contacts, do so at a current value less than the maximum switching current.		
9 Maximum contact capacity	This is the maximum load capacity (switching voltage x switching current) that can be switched without practical problems. Using a capacity value that exceeds the maximum contact capacity may cause the contacts to melt or accelerate deterioration.		
10 Electrical lifespan	This is the lifespan when a load is applied to the contacts. The lifespan of a relay varies depending on the size and type of load, and frequency of use.		
11 Contact resistance (initial value)	This is the resistance between the terminals when the contacts are closed.		
12 Contact resistance variation (initial value)	The contact resistance is measured 5 times and a range between the min and max values is set to ensure stability of the value.		
13 Insulation resistance	This is the resistance of the insulated parts between contacts/coils/conductive terminals and non-conductive terminals (such as an iron core frame or iron core), or between contacts themselves.		
14 Electrostatic capacitance	This is the capacitance between contacts, coils, and conductive terminals.		
15 Breakdown voltage	This is the limit value at which insulation breakdown does not occur between each conductor of the relay. This is the voltage that can be withstood even if a surge is applied between the contacts when the contacts are not operating. For a voltage pulse applied immediately after the contacts operate, the maximum switching voltage is the standard value.		
16 Operate time	This is the time from when the rated voltage is applied to the coil until the contacts operate. (Including bounce. Form A/Form C/FORM (A+B))		
17 Release time	This is the time it takes for the contacts to reset after the rated voltage is removed from the coil. (Including bounce. Form B/Form C/FORM (A+B))		
18 Vibration	This is the vibration resistance value that does not cause changes in properties.		
19 Shock	This is the shock resistance value that does not cause changes in properties.		

4) Precautions for use

4-1) Adding a surge absorbing diode

When driving a coil, please add a clamp diode in parallel to the coil as shown in the diagram on the right.



4-2) Back electromotive force (EMF) of the coil

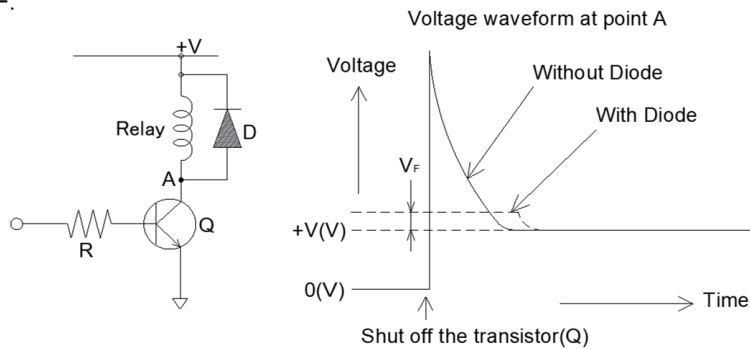
This is the voltage that occurs in an inductive circuit when the current changes and the polarity of the induced voltage at each instant is opposite to the polarity of the applied voltage.

This phenomenon does not occur during direct current flow where the current does not change; however, care must be taken as back EMF occurs when the current begins to flow or is cut off.

The voltage waveform at point A in the diagram can be as much as 10 times the applied voltage, and when a reed relay (coil) on/off is controlled by a transistor,

this can exceed the transistor's withstand voltage (V_{CE}) and destroy the transistor.

For this reason, a protection circuit of a diode in parallel with the reed relay (coil) is effective in absorbing the back EMF.



* If a diode is installed, the release time will be slower due to the influence of V_F (diode forward voltage).

4-3) Terminal bending

When bending the relay terminals for installation, hold the terminals in place with lead pliers before bending them.

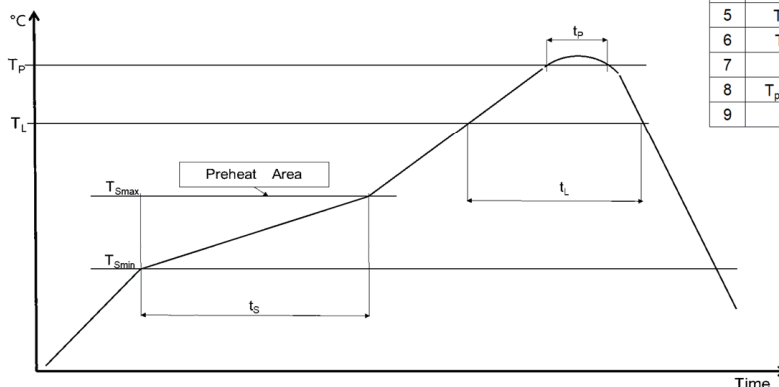
When bending, be careful not to put undue stress on the base of the terminal.

4-4) Soldering conditions

a) Soldering iron: 300 to 350°C

b) Automatic soldering: 230 to 260°C

c) For reflow soldering



No	Symbol	Content	Condition
1	T_p	Peak temperature	260°C
2	t_p	Time in peak temperature	60s max
3	T_L	Liquidous temperature	217°C
4	t_L	Time (t_L) maintained above T_L	60s~150s
5	T_{smax}	Preheat Max temperature	200°C
6	T_{smin}	Preheat Min temperature	150°C
7	t_s	Preheating time	60s~120s
8	$T_p - T_{smin}$	Cooling rate	6°C/s max
9	-	Number of reflow cycles	Three times

4-5) Cleaning

If, after soldering the relay, the board is washed with a solvent (alcohol-based, freon-based) or pure water to remove flux, please note the following:

4-6) Magnetic interference

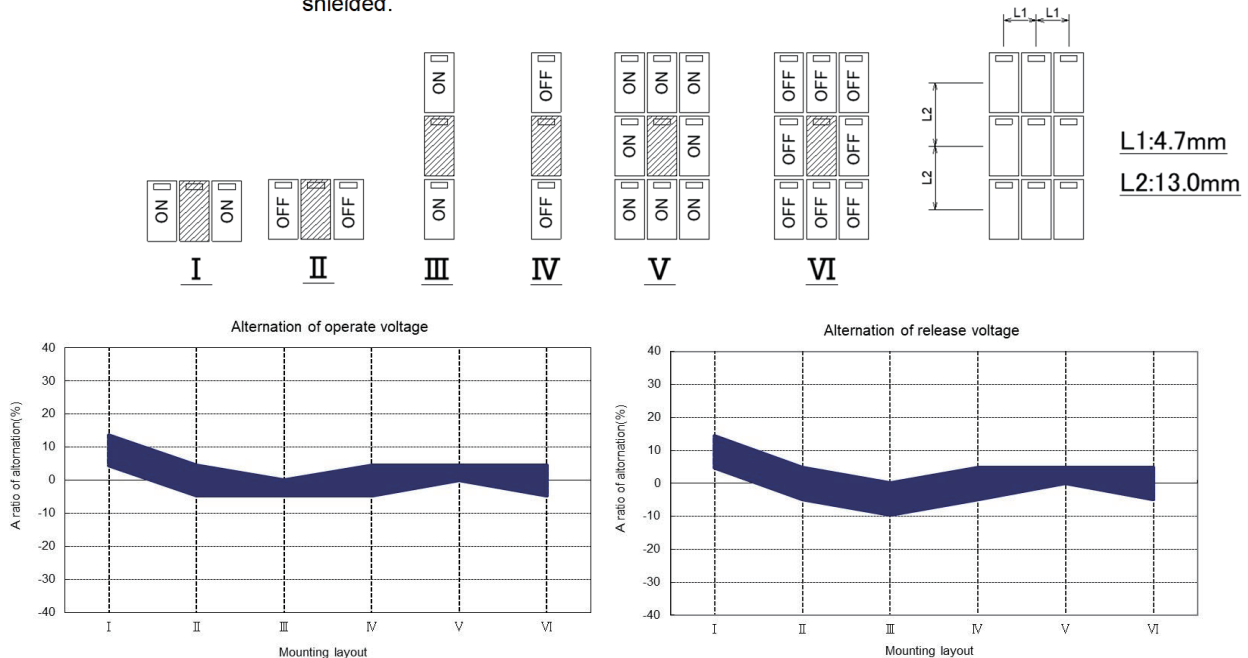
When multiple reed relays are mounted close together, mutual magnetic interference occurs, causing operating and release voltage fluctuations.

The diagrams below illustrate how different configurations of surrounding reed relays can magnetically interfere with the reed relay in the center. This value changes depending on whether or not electricity is applied.

The graphs shows the variations in operation of the central reed relay.

A magnetic shield is an effective way to suppress these fluctuations.

Note: Using a relay in an environment where a strong magnetic field is generated by an external transformer or permanent magnet may cause the relay to malfunction even if it is magnetically shielded.



4-7) Mechanical shock

The properties of the relay may change if it is subjected to mechanical shock, such as being dropped

4-8) Contact protection

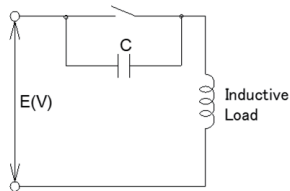
The use of contact protection elements and protection circuits can keep back EMF low, but note that using them incorrectly can have the opposite effect.

The table below shows some typical examples of contact protection circuits.

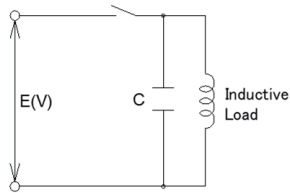
a) Inductive load

Category	Item	Circuit Example	Applications		Properties, etc.	Component selection
			AC	DC		
CR Method			Δ	○	When used with AC voltage, the load impedance must be significantly smaller than the CR impedance. When the contacts are open, current flows through the capacitor and resistor to the inductive load.	C & R guidelines: Capacitor: 0.5 to 1 (μF) per 1A of contact current Resistor: 0.5 to 1 (Ω) per 1V of contact voltage This isn't exact due to the nature of the inductive load and variations in relay characteristics. Please confirm this through experiments, keeping in mind that the capacitor is responsible for the discharge control effect when the contacts are opened, and the resistor is responsible for limiting the current when the switch is next turned on. Generally, the withstand voltage of the capacitor should be 200 to 300V. For AC circuits, use AC capacitors (no polarity).
			○	○	If the load is a relay or solenoid, the release time will be delayed. When the power supply voltage is 24 or 48V, it is better to connect between the loads. When it is 100 to 200V, connecting between the contacts is better.	
Diode Method			○	○	The energy stored in the inductive load is passed in the form of current to the coil via a parallel diode, and is dissipated as Joule heat by the resistance of the inductive load.	Use a diode with a reverse withstand voltage of 10 times or more than the circuit voltage and a forward current equal to or greater than the inductive load current. In electronic circuits, if the circuit voltage is not very high, capacitors with a reverse withstand voltage of about 2 to 3 times the power supply voltage can be used.
Diode + Zener Diode Method			○	○	Effective when the release time is too slow with the diode method.	The Zener voltage of the Zener diode should be approximately the same as the power supply voltage.
Varistor Method			○	○	This method uses the constant voltage characteristics of the varistor to prevent too high a voltage from being applied across the contacts. When the power supply voltage is 24 to 48V, it is better to connect between the loads. When it is 100 to 200V, connecting between the contacts is better.	

Avoid using circuits like those shown below.



Very effective in extinguishing the arc when cut off, but because capacitance is stored in C when the contacts are opened, a short-circuit current flows in C when the contacts are closed, making them susceptible to becoming fused together.



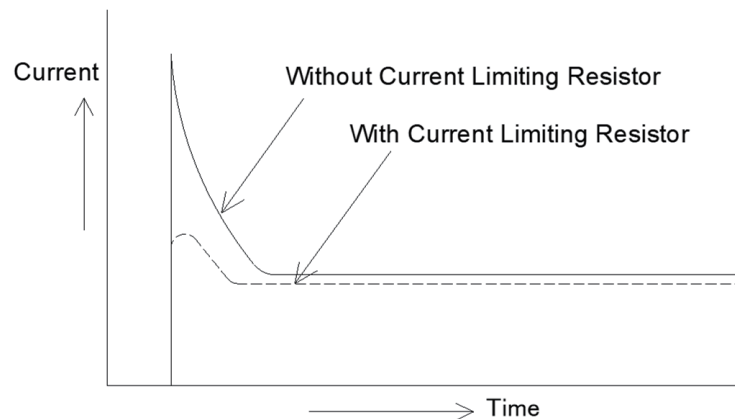
Very effective in extinguishing the arc when cut off, but a charging current flows in C when the contacts are closed, making them susceptible to becoming fused together.

b) Lamp load (inrush current), etc

When the contact load is a lamp, motor, solenoid, capacitor, etc., an inrush current several times to several dozen times the steady-state current flows when the contact is closed.

If this inrush current exceeds the allowable range, it can cause contact failure due to contact fusion or transfer of contact metal. The allowable inrush current of a reed relay is determined by factors such as the magnitude of the inrush current, its waveform, and the number of cycles required of the reed relay contacts.

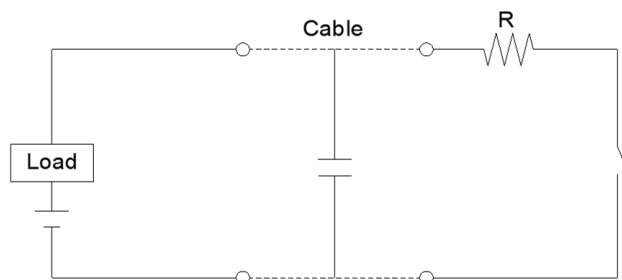
Inserting a current-limiting resistor in series with the contacts is an effective way to suppress the inrush current below the maximum switching current. Please refer to the diagram to check whether the product can be used under the actual conditions.



c) Line-to-line stray capacitance

Inrush current that occurs when line-to-line stray capacitance is large can be a problem.

As shown in the figure, the charge stored in the stray capacitance between the lines is discharged when the contacts are closed. The smaller the impedance of the wiring cable and the longer the cable, the greater the contact wear. Please insert a current-limiting resistor in series with the contact as a protection circuit to suppress the inrush current.



4-9) Thermoelectromotive force

When dissimilar metals are connected and the junction is kept at different temperatures, a current flows through the circuit due to the Seebeck effect. The electromotive force that generates this current is called thermoelectromotive force. For reed relays, thermal electromotive forces are generated between the dissimilar metals of the terminals, contact pieces, and contact points.

When a thermocouple is switched using a reed relay, this thermoelectromotive force can cause a difference between the measured temperature and actual temperature.

Seebeck effect :

A phenomenon when different metals A and B are bonded in a ring to create a closed circuit.

The two junctions are kept at different temperatures, generating an electromotive force at the junctions and causing an electric current to flow. This is the opposite of the Peltier effect.

If the temperature is reversed, the electromotive force (current) will also be reversed.

This phenomenon is the mechanism behind thermocouples because it allows measurement over a relatively wide temperature range.

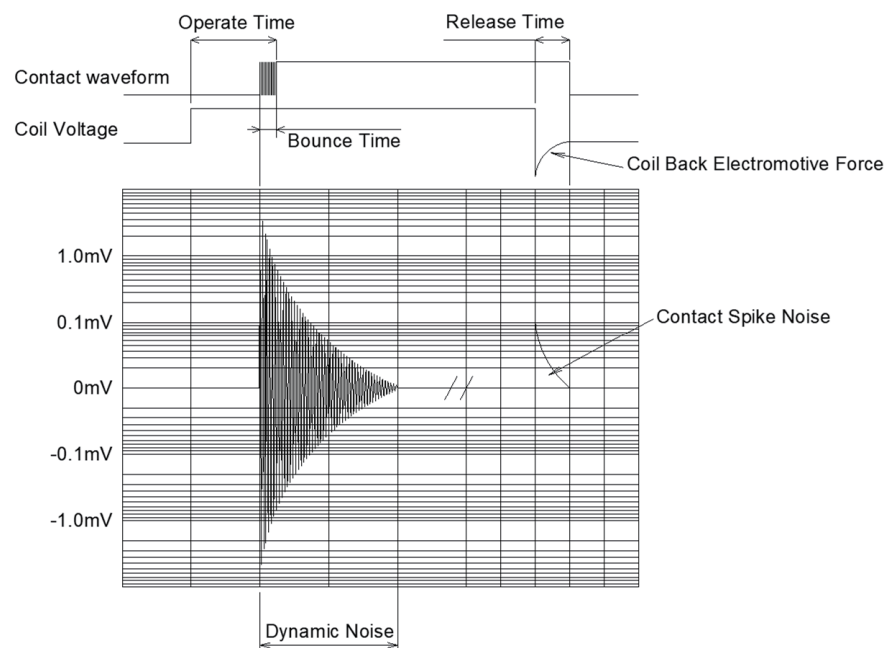
4-10) Dynamic properties of reed relays

When current flows through a reed relay, there is a consistent sequence of events that occur.

These phenomena occur regardless of the type of reed relay.

Details of these contact phenomena are shown in the figure below.

Figure: Overview of dynamic properties



Dynamic noise is a noise component that is generated mainly due to the wavering of the contacts that continues even after the bounce has ended.

Dynamic Noise

After the contacts close, the energy dissipates with damped oscillation similar to that of a plucked harp string.

During damped vibration, some areas on the contacts are stressed and generate an electrical signal.

This electrical signal is an AC audible signal with a very wide frequency range that oscillates with damped sine waves, with the amplitude and duration of the noise depending on the following conditions.

- * Contact spike noise occurs when the contacts try to separate from each other after the applied voltage on the coil is removed

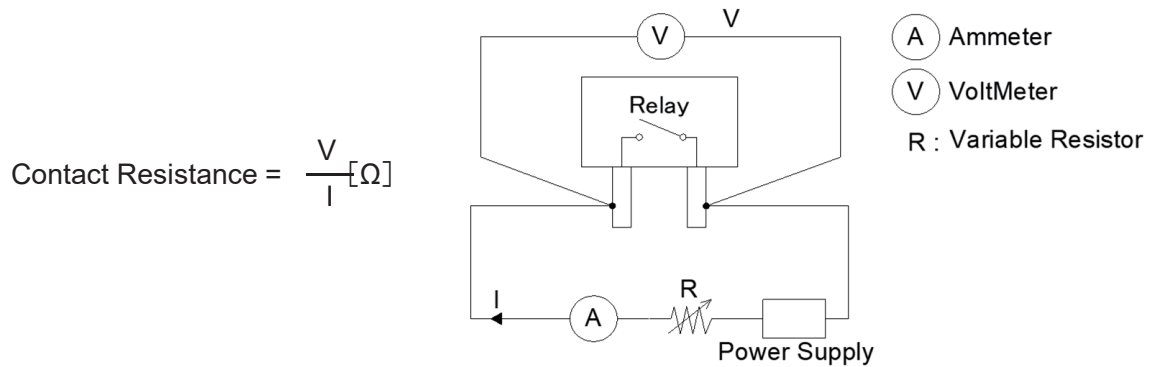
5) Explanation of operation and measurement

5-1) Contact resistance

Contact resistance is the combined value of the inherent resistance of the conductors that make up the circuit, such as the movable parts, terminals, and contacts, and the resistance at the point where the contacts come into contact. The contact resistance value is an initial value, and the level of this value does not indicate whether the relay will be good or bad in actual use.

The contact resistance is measured using the voltage drop method (four terminal method) as shown in the figure, with a measurement current of 1mA.

Contact measurement schematic diagram



5-2) Operate and release voltage

a) Operate voltage

This is the minimum voltage required for all contacts to operate when the coil voltage is increased either suddenly or gradually.

b) Release voltage

This is the voltage at which all contacts return to their original position when the coil voltage is decreased either suddenly or gradually.

5-3) Operate time

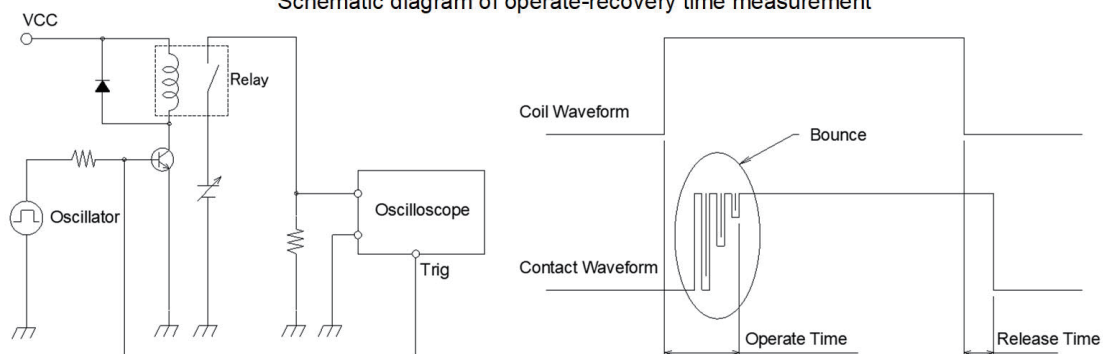
The time from when the rated voltage is applied to the coil until the contacts operate.

In the case of a reed relay with multiple contacts, unless otherwise specified, it will be the time it takes for the slowest contact to operate.

5-4) Release time

The time it takes for the contacts to return to their original position after the rated voltage is removed from the coil. In the case of a reed relay with multiple contacts, unless otherwise specified, it will be the time it takes for the slowest contact to return to its original position.

Schematic diagram of operate-recovery time measurement



* What is bounce?

An intermittent switching phenomenon between contacts caused by vibration from the collision of the moving part of a contact with the moving part of the opposing contact or the backstop.

5-5) Capacitance

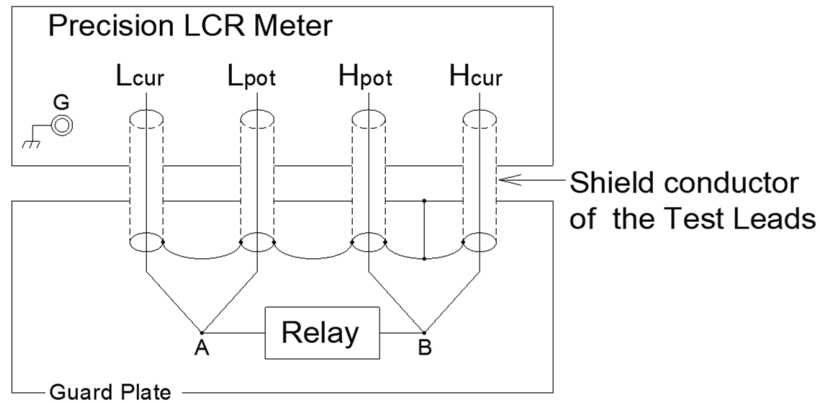
In a reed relay, capacitance occurs between each conductor.
The conditions for measuring capacitance are listed below.

a) Measurement conditions

Bias voltage : 1VDC

Measurement frequency : 1MHz

Capacitance measurement schematic diagram



* When measuring capacitance, the object to be measured is suspended above the shield plate.

b) Measurement method

b-1) Points A and B are positioned based on the distance between the terminals of the relay to be measured.

b-2) The LCR Meter is calibrated.

b-3) Points A and B are connected to the relay and capacitance is measured.

(If an electrostatic shield is attached, the terminal is connected to the GND terminal of the LCR Meter to measure the capacitance.)

5-6) Breakdown voltage

This is the limit value at which no dielectric breakdown occurs when voltage is applied for one minute to the insulated parts between contacts, coils, between conductive terminals and non-current-carrying metal parts (such as an iron core frame or iron core), or between contacts.

Testing is done in a dark room with no radiation (light or X-rays) and a leakage current (current for detecting dielectric breakdown) of 1mA. A distinctive feature of this test is that it is performed using a fast rising waveform when measuring the breakdown voltage.

(The voltage waveform during a breakdown voltage test is shown below.)



Oscilloscope Settings
Voltage range : 50V/1div
Frequency range : 1ms/1div

Example of voltage waveform when 200V is applied

5-8) High-frequency properties

At Sanyu, when testing high-frequency properties, we mainly evaluate the following.

TDR(Time Domain Reflectometry)

TDT(Time Domain Transmission)

Isolation

Insertion Loss

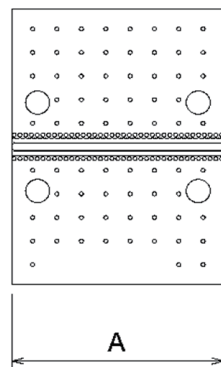
Return Loss

a) Measurement board

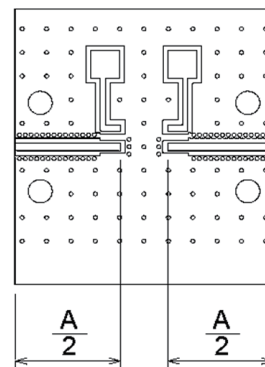
We use the following types of boards for evaluation.

Please note that the wiring on the board may differ depending on the product shape.

Through-hole (reference)



Relay mount board (reference)



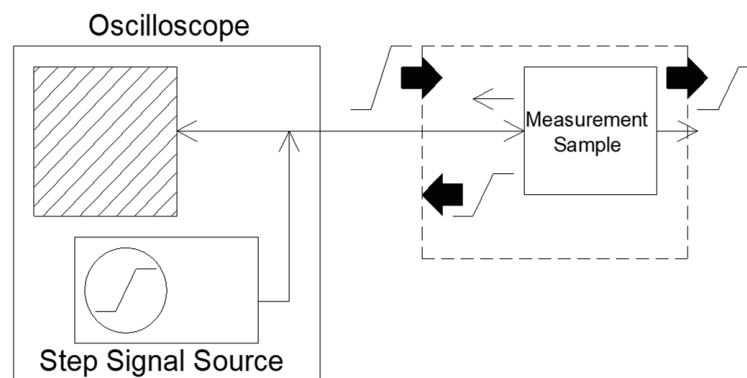
The characteristic impedance of the transmission line is 50 Ω .

(Board specifications used are an example.)

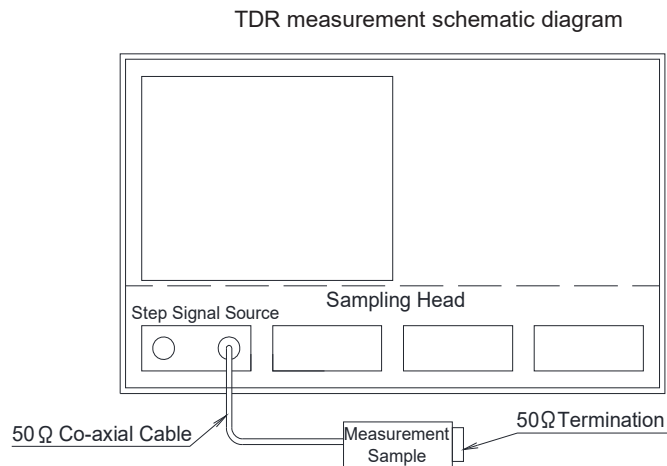
b) TDR/TDT

TDR measurements consist of a step signal source and a wideband oscilloscope to capture the reflected signal at the impedance discontinuity in the transmission line and display the voltage and impedance values of the reflected signal as a function of time.

Additionally, measurement of the propagated transmission signal is called TDT and is used to measure propagation delay. Since transmitted signals are distorted by reflections and delays, TDR/TDT provide intuitive measurement results and are essential evaluation criteria.

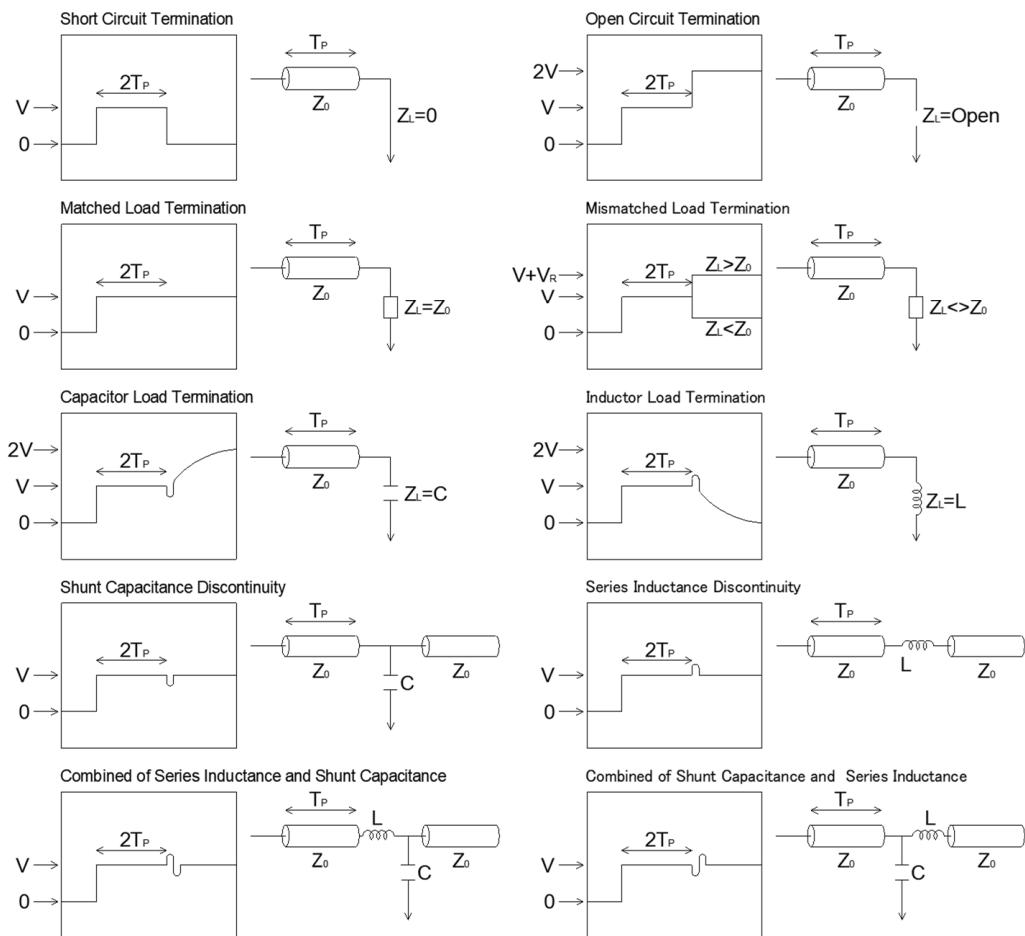


b-1) TDR measurement overview

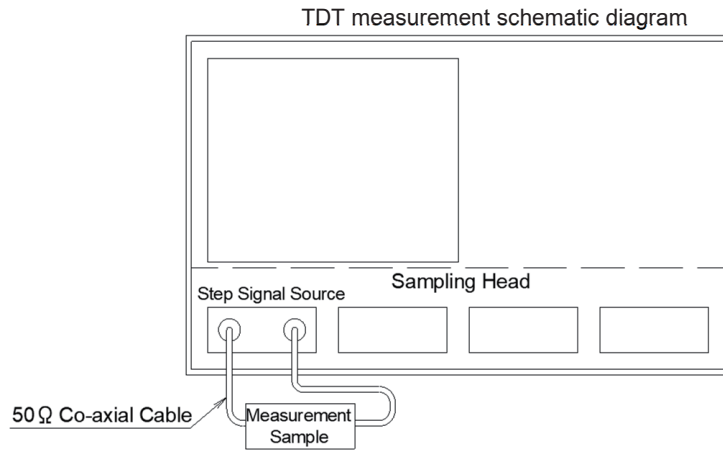


b-2) Measurement method

When the device under test is connected to the measurement equipment and output is started from the TDR signal source channel, a waveform appears on the wideband oscilloscope screen. The impedance state of the measurement sample can be understood from the waveform. An example of a TDR measurement waveform is shown below

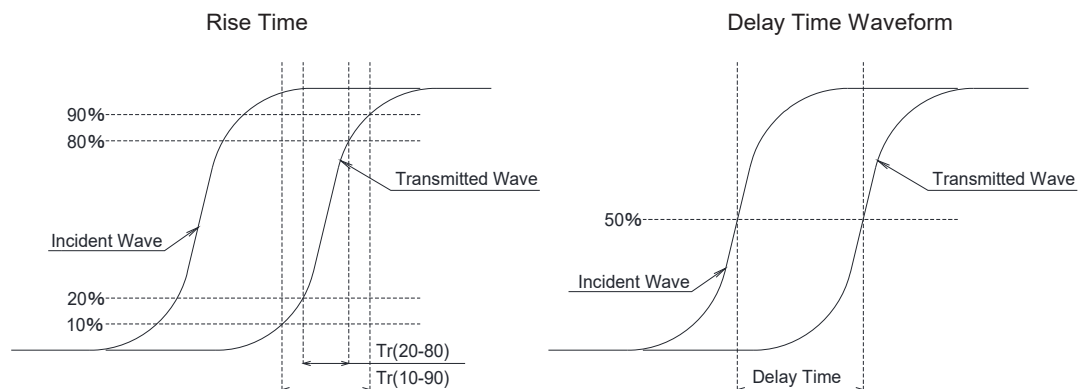


b-3) TDT measurement overview



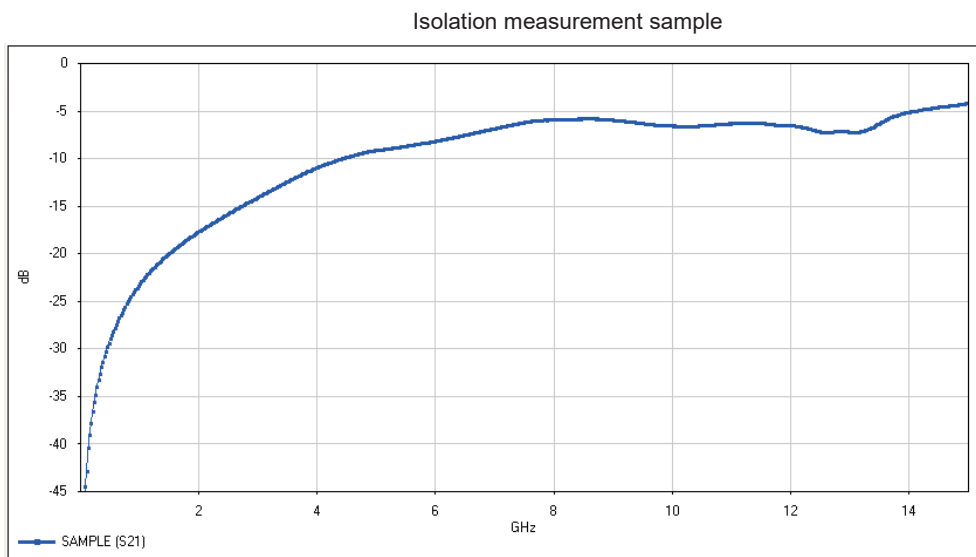
b-4) Measurement method

The voltage output from the step signal source is applied to the measurement sample and the transmitted wave is monitored. An example of a TDT measurement waveform is shown below.



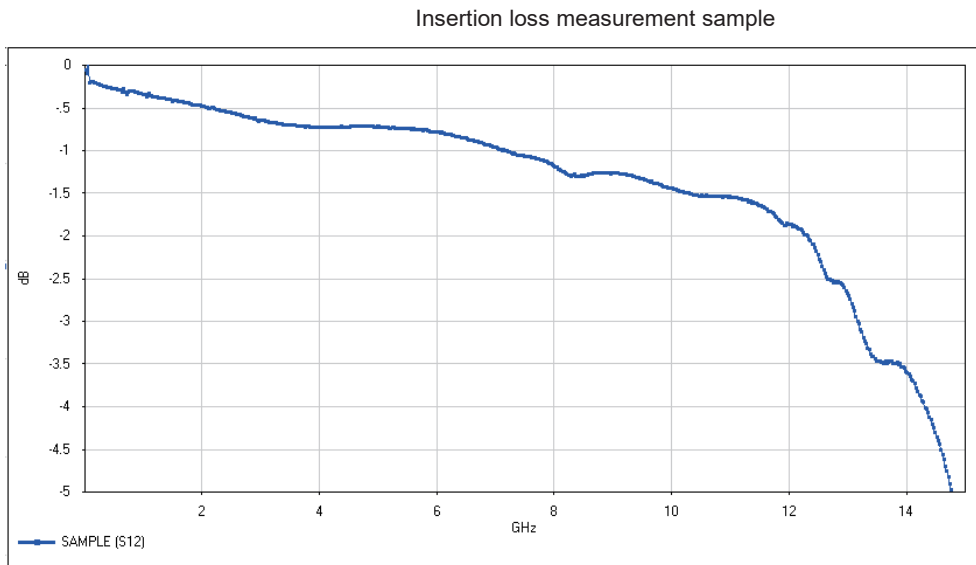
c) Isolation

This indicates the degree of insulation for high-frequency signals. Even when the relay contacts are open, high-frequency signals can leak due to stray capacitance. The insulation that suppresses this leakage is called isolation. An example of an isolation measurement result is shown below.



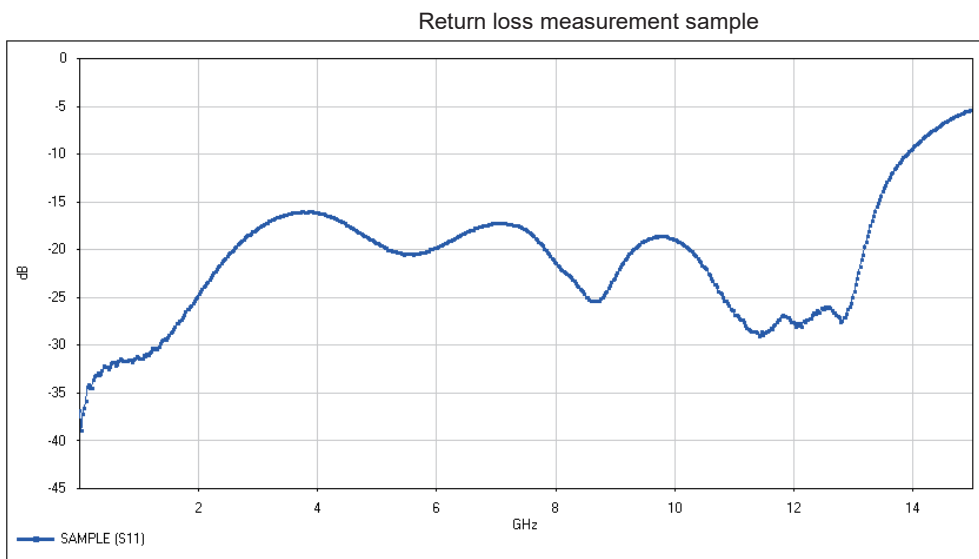
d) What is insertion loss?

This refers to the high-frequency signal insertion loss in the transmission line (when the relay is closed). It represents the loss due to impedance mismatch in the circuit of the device under test.



e) What is return loss?

This refers to the reflection from the device under test (when the relay is closed). When an incident wave in a transmission line encounters an impedance mismatch, a reflected wave is generated. If the impedance is matched, there will be no reflections.

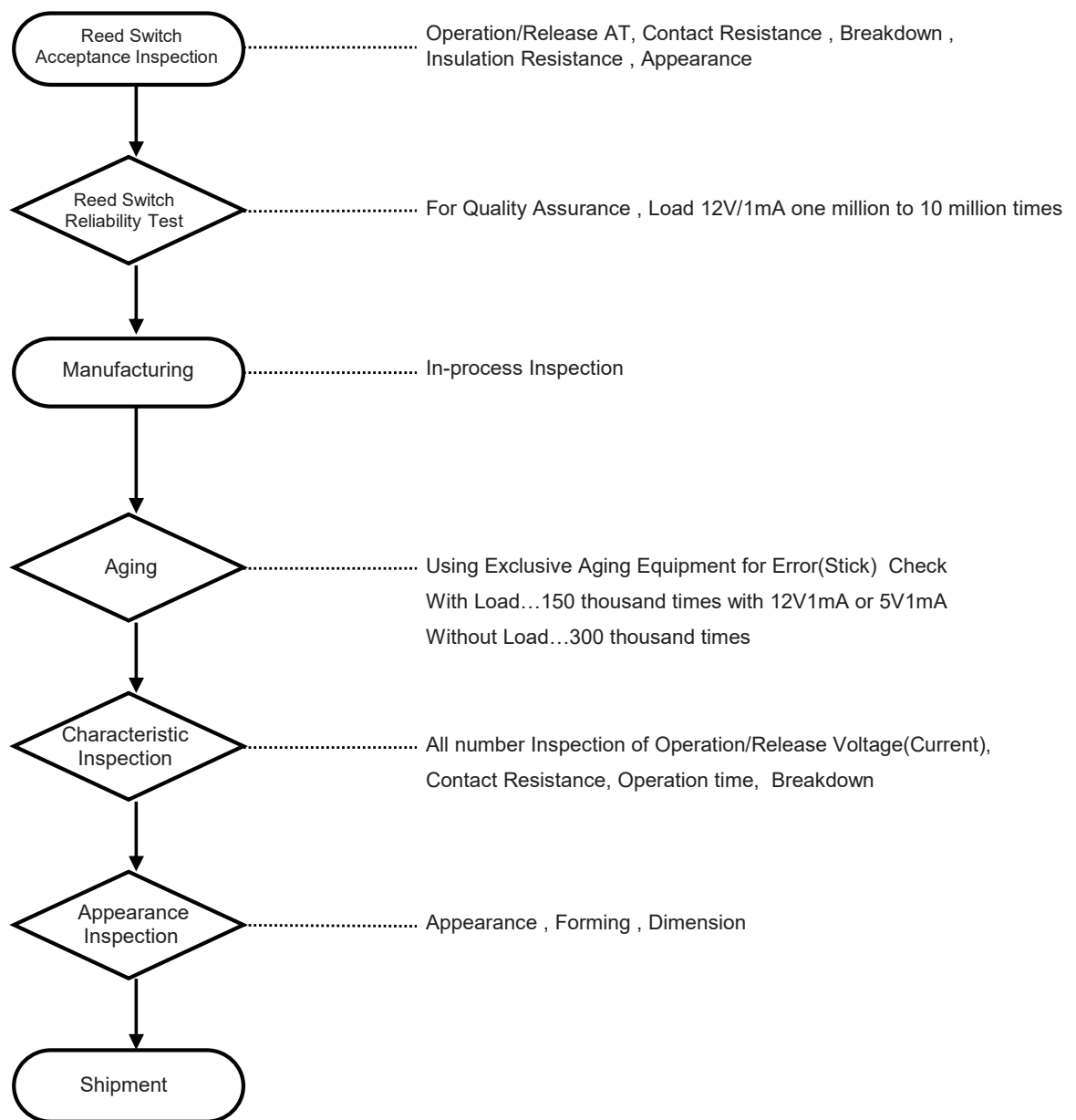


f) Regarding of high frequency data

We can provide a high frequency data of our products with de-embedding. Feel free to ask our sales team.

6) Reed and mercury relay quality

Quality control is carried out according to the following flow chart.



6-1) Aging (with and without load)

Although the contact points are plated, the surfaces are covered in countless tiny irregularities.

If left in this state, the contact resistance will become slightly unstable, so aging is done to smooth and stabilize the contact surface.

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When failure, drift, leakage, or lifecycle cost matters, availability is not enough. OEM manufacturing control determines:

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- Qualification confidence
- Cost over life of your platform

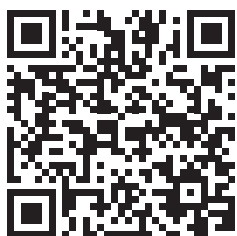
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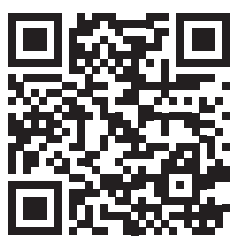
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