POWER RELAY

1 POLE—1, 3, 5, 10 A
(MEDIUM LOAD CONTROL)

LZ SERIES

RoHS compliant

■ FEATURES

- UL, CSA, SEV recognized
- 4 kinds of contact ratings
  —Low level to 10 amps switching
- Standard and high sensitivity types available
- High surge strength version available
- UL class B (130°C) insulation type available (only plastic sealed type)
- Printed circuit terminals—fits grid with 0.1 inch
- Plastic sealed type available
- Lead Free since date code: 0437L2
  Please see page 9 for more information

■ ORDERING INFORMATION

[Example] LZ – B 12 H M S E – K HV – UC
(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

(a)	Series Name	LZ : LZ Series
(b)	Coil Heat Proof Class	Nil : Standard type B : UL class B insulation type (130°C)
(c)	Nominal Voltage	Refer to the COIL DATA CHART
(d)	Contact Rating	Nil : 3 A H : 5 A V : 10 A (standard coil power only) W : 1 A (bifurcated)
(e)	Contact Arrangement	Nil : 1 form C (SPDT) M : 1 form A (SPST-NO)
(f)	Coil Power	Nil : Standard type (450 to 600 mW) S : High sensitive type (330 mW)
(g)	Contact Material (Rating)	Nil : Gold overlay silver-palladium (1A) (only LZ-W) Nil : Gold overlay silver-nickel (3 A, 5 A) Nil : Silver alloy (10 A) (only LZ-V) (contains cadmium) E : Silver-nickel (3 A, 5 A)
(h)	Enclosure	Nil : Flux free type K : Plastic sealed type (recommended for new designs) C : Plastic sealed type (with tape)
(i)	Surge Strength	Nil : Standard type (4,000 V) HV: High surge strength type (6,000 V)
(j)	Standard	UC: UL, CSA approved type

■ COIL DATA CHART

LZ Standard

MODEL				Nominal Voltage	Coil Resistance (±10%)	Must Operate Voltage*	Must Release Voltage*	Nominal Power
Single			Bifurcated					
10 A Type	5 A Type	3 A Type	1 A Type					
LZ-(B) 1.5VM	LZ-(B)1.5H(M)(E)	LZ-(B) 1.5(M)(E)	LZ-(B)1.5W(M)	1.5 VDC	5	0.97 VDC	0.08 VDC	450 mW
LZ-(B) 3VM	LZ-(B) 3H(M)(E)	LZ-(B) 3 (M)(E)	LZ-(B) 3 W(M)	3 VDC	20	1.95 VDC	0.15 VDC	450 mW
LZ-(B) 5VM	LZ-(B) 5H(M)(E)	LZ-(B) 5 (M)(E)	LZ-(B) 5 W(M)	5 VDC	56	3.25 VDC	0.25 VDC	450 mW
LZ-(B) 6VM	LZ-(B) 6H(M)(E)	LZ-(B) 6 (M)(E)	LZ-(B) 6 W(M)	6 VDC	80	3.9 VDC	0.3 VDC	450 mW
LZ-(B) 9VM	LZ-(B) 9H(M)(E)	LZ-(B) 9 (M)(E)	LZ-(B) 9 W(M)	9 VDC	180	5.85 VDC	0.45 VDC	450 mW
LZ-(B) 12VM	LZ-(B) 12H(M)(E)	LZ-(B 12 (M)(E)	LZ-(B) 12 W(M)	12 VDC	320	7.8 VDC	0.6 VDC	450 mW
LZ-(B) 18VM	LZ-(B) 18H(M)(E)	LZ-(B) 18 (M)(E)	LZ-(B) 18 W(M)	18 VDC	720	11.7 VDC	0.9 VDC	450 mW
LZ-(B) 24VM	LZ-(B) 24H(M)(E)	LZ-(B) 24 (M)(E)	LZ-(B) 24 W(M)	24 VDC	1,280	15.6 VDC	1.2 VDC	450 mW
LZ-(B) 48VM	LZ-(B) 48H(M)(E)	LZ-(B) 48 (M)(E)	LZ-(B) 48W(M)	48 VDC	3,800	28.8 VDC	2.4 VDC	600 mW
LZ-(B)100VM	LZ-(B)100H(M)(E)	LZ-(B)100(M)(E)	LZ-(B)100W(M)	100VDC	22,200	65.0 VDC	5.0 VDC	450 mW
LZ-(B) 1.5 V				1.5 VDC	5	1.2 VDC	0.08 VDC	450 mW
LZ-(B) 3V				3 VDC	20	2.4 VDC	0.15 VDC	450 mW
LZ-(B) 5V				5 VDC	56	4.0 VDC	0.25 VDC	450 mW
LZ-(B) 6V				6 VDC	80	4.8 VDC	0.3 VDC	450 mW
LZ-(B) 9V				9 VDC	180	7.2 VDC	0.45 VDC	450 mW
LZ-(B) 12V				12 VDC	320	9.6 VDC	0.6 VDC	450 mW
LZ-(B) 18V				18 VDC	720	14.4 VDC	0.9 VDC	450 mW
LZ-(B) 24V				24 VDC	1,280	19.2 VDC	1.2 VDC	450 mW
LZ-(B) 48V				48 VDC	3,800	38.4 VDC	2.4 VDC	600 mW
LZ-(B) 100V				100VDC	22,200	80.0 VDC	5.0 VDC	450 mW

LZ-( )S High Sensitive

MODEL				Nominal Voltage	Coil Resistance (±10%)	Must Operate Voltage*	Must Release Voltage*	Nominal Power
Single			Bifurcated					
10 A Type	5 A Type	3 A Type	1 A Type					
	LZ-(B)1.5H(M)S, (E)	LZ-(B)1.5(M)S, (E)	LZ-(B)1.5W(M)S	1.5 VDC	6.8	0.97 VDC	0.08 VDC	330 mW
	LZ-(B) 3H(M)S, (E)	LZ-(B) 3 (M)S, (E)	LZ-(B) 3 W(M)S	3 VDC	27	1.95 VDC	0.15 VDC	330 mW
	LZ-(B) 5H(M)S, (E)	LZ-(B) 5 (M)S, (E)	LZ-(B) 5 W(M)S	5 VDC	80	3.25 VDC	0.25 VDC	330 mW
	LZ-(B) 6H(M)S, (E)	LZ-(B) 6(M)S, (E)	LZ-(B) 6 W(M)S	6 VDC	110	3.9 VDC	0.3 VDC	330 mW
	LZ-(B) \9H(M)S, (E)	LZ-(B) 9(M)S, (E)	LZ-(B) 9 W(M)S	9 VDC	250	5.85 VDC	0.45 VDC	330 mW
	LZ-(B) 12H(M)S, (E)	LZ-(B 12(M)S, (E)	LZ-(B)12 W(M)S	12 VDC	440	7.8 VDC	0.6 VDC	330 mW
	LZ-(B) 18H(M)S, (E)	LZ-(B)18 (M)S, (E)	LZ-(B)18 W(M)S	18 VDC	990	11.7 VDC	0.9 VDC	330 mW
	LZ-(B) 24H(M)S, (E)	LZ-(B) 24(M)S, (E)	LZ-(B)24 W(M)S	24 VDC	1,780	15.6 VDC	1.2 VDC	330 mW

Note : All values in the table are measured at 20°C.
*: Specified values are subject to pulse wave voltage.

■ SPECIFICATIONS

LZ-( )Type (Standard Type)

Item			10 A Type		5 A Type	3 A Type	1 A Type
			LZ-()V	LZ-( )VM	LZ-( )H, LZ-( )HE	LZ( ), LZ-( )E	LZ-( )W
Contact	Arrangement		1 form A (SPST-NO) or 1 form C (SPDT)				
	Material		Silver alloy (contains cadmium)		Gold overlay silver alloy Silver alloy (LZ-HE, E)		Gold overlay silver-palladium
	Configuration		Single		Single (crossbar)		Bifurcated (crossbar)
	Resistance (initial) (at 1 A 6 VDC)		Maximum 100 mΩ		Maximum 70 mΩ (LZ-H,LZ) Maximum 100 mΩ (LZ-HE, E)		Max. 50 mΩ
	Rating (resistive)		10 A 120 VAC/24 VDC 1/4 HP 120 VAC		5 A 120 VAC/24 VDC 1/8 HP 120 VAC	3 A 120 VAC/30 VDC 1/10 HP 120 VAC	1 A 120 VAC/30 VDC
	Maximum Carrying Current		10 A		5 A		1 A
	Maximum Switching Power		1,680 VA, 240 W		960 VA, 120 W	600 VA, 90 W	190 VA, 30 W
	Maximum Switching Voltage		250 VAC, 150 VDC				
	Maximum Switching Current		10 A		5 A	3 A	1 A
	Minimum Switching Load*1		100 mA 5 VDC		10 mA 5 VDC (LZ-H) 100 mA 5 VDC (LZ-HE)	10 mA 5 VDC (LZ-) 100mA 5VDC (LZ-E)	0.1 mA 100 mVDC
Coil	Nominal Power (at 20°C)		450 to 600 mW				
	Operate Power (at 20°C)		290 to 390mW		170 to 220 mW		
	Operating Temperature		–30°C to +70°C (no frost) (refer to the CHARATERISTIC DATA)				
Time Value	Operate (at nominal voltage)		Maximum 7 ms				
	Release (at nominal voltage)		Maximum 4 ms				
Life	Mechanical		2 x 10^7 operations minimum				
	Electrical		1 x 10^5 operations minimum (contact rating)				
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)				
		Endurance	10 to 55 Hz (double amplitude of 3.3 mm)				
	Shock Resistance	Misoperation	100 m/s^2 (11 ±1 ms)				
		Endurance	1,000 m/s^2 (6 ±1 ms)				
	Weight		Approximately 7.7g				

*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

■ SPECIFICATIONS

LZ-( ) S Type (High Sensitive Type)

Item			5 A Type LZ-( )HS, LZ( )HSE	3 A Type LZ-( )S, LZ-( )SE	1 A Type LZ-( )WS
Contact	Arrangement		1 form A (SPST-NO) or 1 form C (SPDT)		
	Material		Gold overlay silver nickel	Silver nickel (LZ-HSE, SE)	Gold overlay silver-palladium
	Configuration		Single (crossbar)		Bifurcated (crossbar)
	Resistance (initial) (at 1 A 6 VDC)		Maximum 70 mΩ (LZ-HS, S) Maximum 100 mΩ (LZ-HSE, SE)		Maximum 50 mΩ
	Rating	Resistive	5 A 120 VAC/24 VDC	3 A 120 VAC/30 VDC	1 A 120 VAC/30 VDC
		Motor Load	1/8 HP 120 VAC	1/10 HP 120 VAC	
	Maximum Carrying Current		5 A		1 A
	Maximum Switching Power		960 VA, 120 W	600 VA, 90 W	190 VA, 30 W
	Maximum Switching Voltage		250 VAC, 150 VDC		
	Maximum Switching Current		5 A	3 A	1 A
	Minimum Switching Load*1		10 mA 5 VDC (LZ-HS, S) 100 mA 5 VDC (LZ-HSE, SE)		0.1 mA 100 mVDC
Coil	Nominal Power (at 20°C)		330 mW		
	Operate Power (at 20°C)		140 mW		
	Operating Temperature		–30°C to +80°C (no frost) (refer to the CHARACTERISTIC DATA)		
Time Value	Operate (at nominal voltage)		Maximum 7 ms		
	Release (at nominal voltage)		Maximum 4 ms		
Insulation	Resistance		Minimum 250 MΩ		
	Dielectric Strength	between open contacts	750 VAC 1 minute		
		between coil and contacts	2,000 VAC 1 minute		
	Surge Strength		Standard type : 4,000 V (at 1.2 × 50 μs) High surge strength type: 6,000 V (at 1.2× 50 μs)		
Life	Mechanical		2 × 10^7 operations minimum		
	Electrical		1× 10^5 operations minimum (rated load)		
Other	Vibration	Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)		
	Resistance	Endurance	10 to 55 Hz (double amplitude of 3.3 mm)		
	Shock	Misoperation	100 m/s ^{2} (11 ±1 ms)		
	Resistance	Endurance	1,000 m/s ^{2} (6 ±1 ms)		
	Weight		Approximately 7.7 g		

*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

■ INSULATION

LZ: Standard type

Item		10A	5A	3A	1A
Resistance (500VDC)		Min. 250 MΩ			
Dielectric strength	open contacts	750 VAC 1min.			
	coil and contacts	2,000 VAC 1 min.			
Surge voltage		Standard: 4,000V, High Surge: 6,000V 1.2 x 50μs standard wave			

LZ-( )S: High sensitive type

Item		10A	5A	3A
Resistance (500VDC)		Min. 250 MΩ		
Dielectric strength	open contacts	750 VAC 1min.		
	coil and contacts	2,000 VAC 1 min.		
Surge voltage		Standard: 4,000V, High Surge: 6,000V 1.2 x 50μs standard wave		

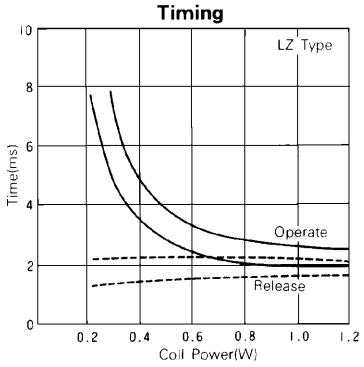
■ SAFETY STANDARD AND FILE NUMBERS

Type	Compliance	Contact rating
UL	UL 508 E 56149, E 45026	Flammability: UL 94-V0 (plastics) [LZ-( )W, LZ-( )WS] 0.8A, 240VDC (resistive) 1A, 120VAC / 30VDC (resistive) [LZ-( ), LZ-( )S] 2.5A, 240 VDC (resistive) 3A, 120 VAC / 30VDC (resistive) 1/10 HP, 120VAC/2400VAC Pilot duty: D150 [LZ-( ), LZ-( )S] 2.5A, 240 VAC (resistive) 3A, 120 VAC / 30VDC (resistive) 1/10 HP, 120VAC/2400VAC Pilot duty: D150 [LZ-( )V] 7A, 240 VDC (resistive) 10A, 120 VAC / 30VDC (resistive) 1/4 HP, 120VAC/2400VAC
CSA	C22.2 No. 14 LR 35579	

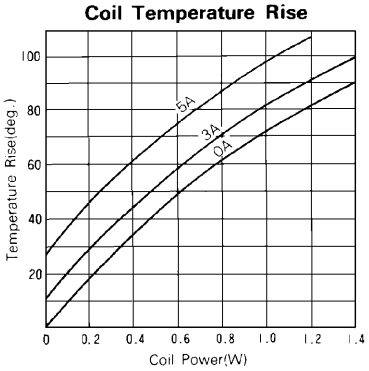
Also complies with SEV

■ CHARACTERISTIC DATA

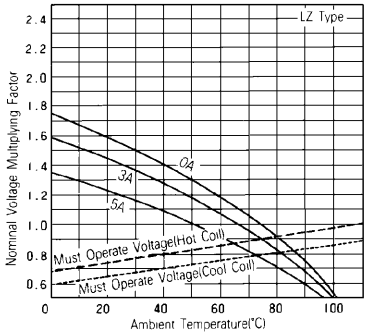
Timing



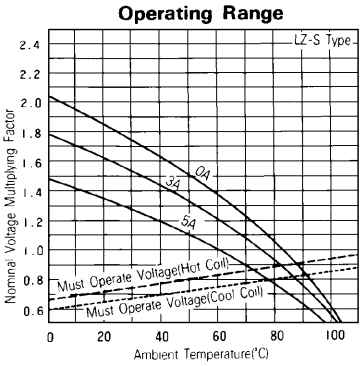
Coil Temperature Rise



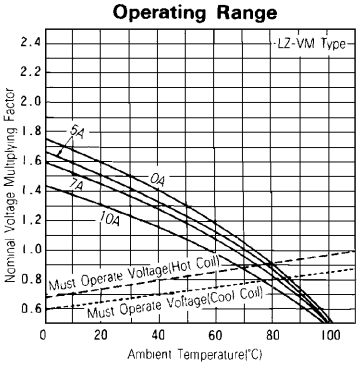
Operating Range



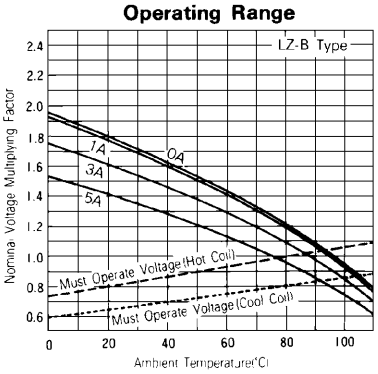
Operating Range



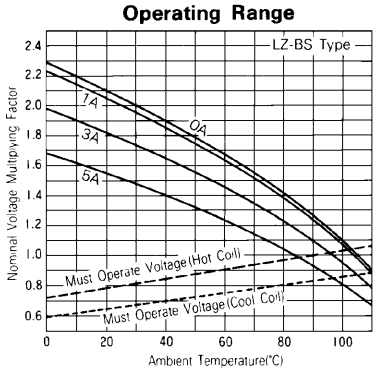
Operating Range



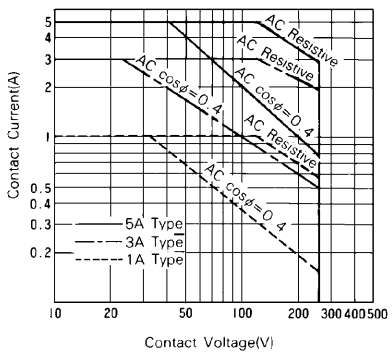
Operating Range



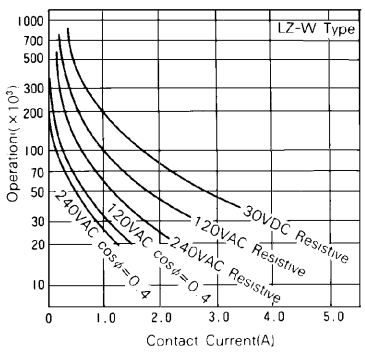
Operating Range



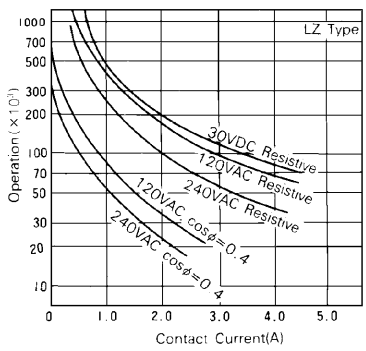
Maximum Switching Power



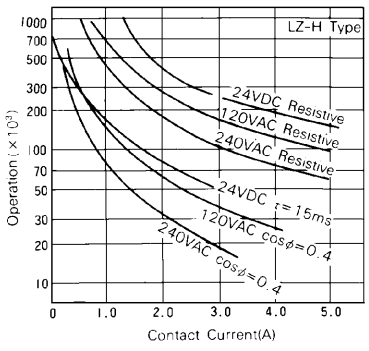
Life Curves



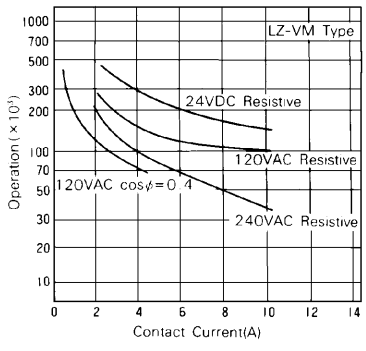
Life Curves



Life Curves

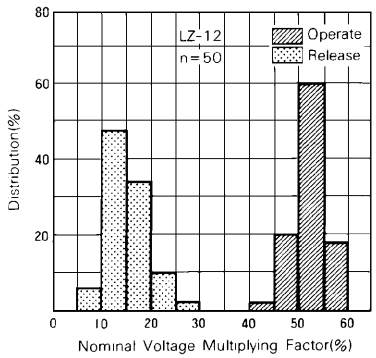


Life Curves

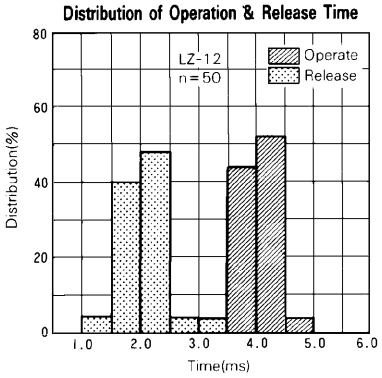


■ REFERENCE DATA

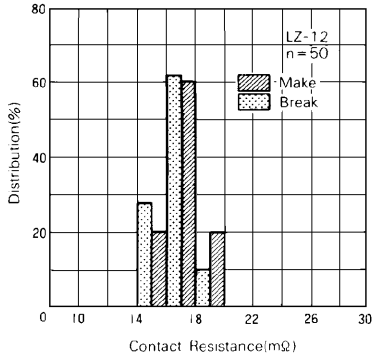
Distribution of Operate & Release Voltage



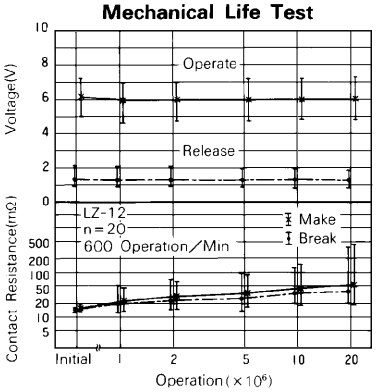
Distribution of Operation & Release Time



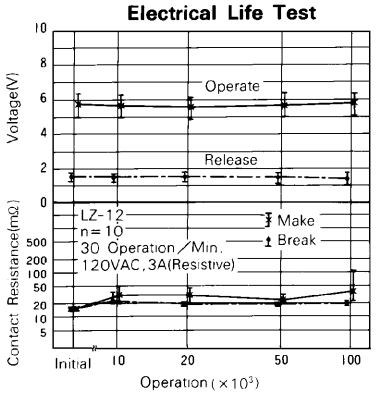
Distribution of Contact Resistance



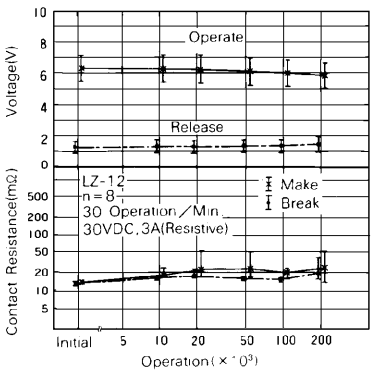
Mechanical Life Test



Electrical Life Test



Electrical Life Test



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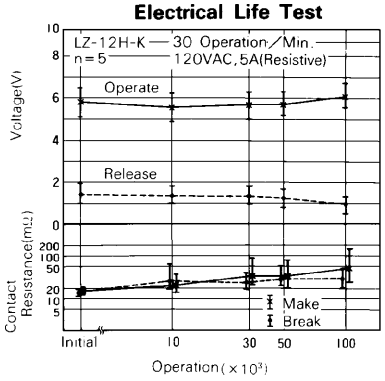

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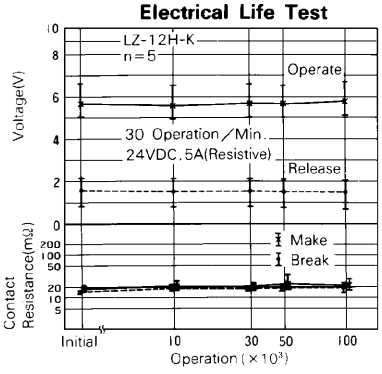
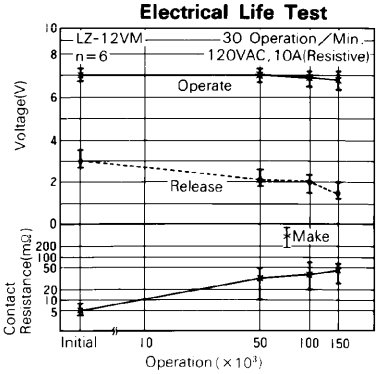


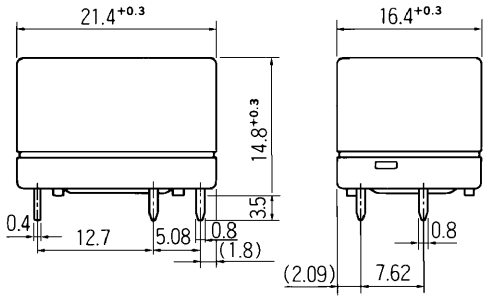
Electrical Life Test

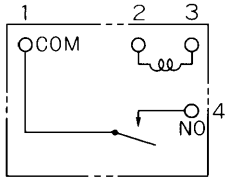


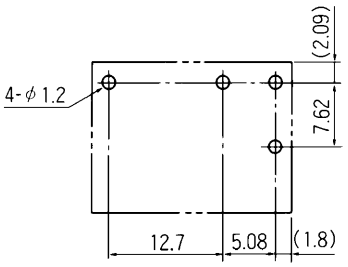
■ DIMENSIONS

- **Dimensions**
- **Schematics** (BOTTOM VIEW)
- **PC board mounting hole layout** (BOTTOM VIEW)

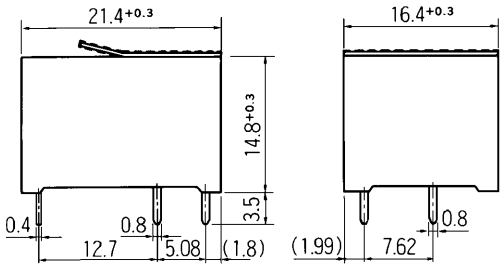
LZ-M type

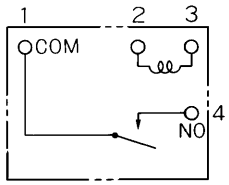


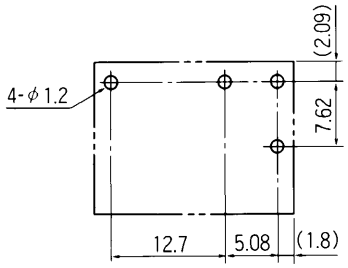




LZ-M-K, LZ-M-C type (Plastic sealed type)

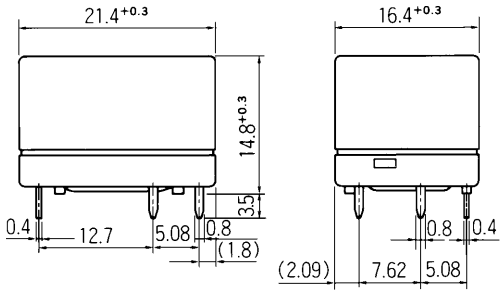


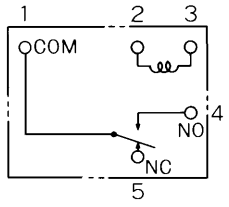


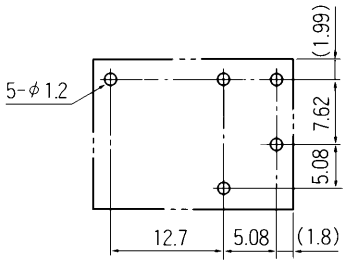


Dotted line: Seal tape [LZ-M-C Type]

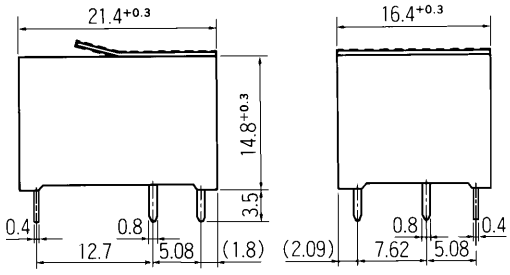
LZ type

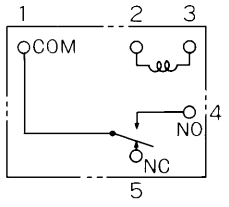


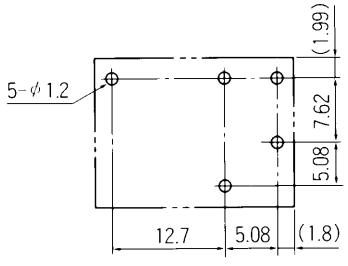




LZ-K, LZ-C type (Plastic sealed type)







Dotted line: Seal tape [LZ-C Type]

Unit: mm

RoHS Compliance and Lead Free Relay Information

1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- “LF” is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

Reflow Solder condtion

Flow Solder condtion:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C soler bath

Solder by Soldering Iron:

Soldering Iron Temperature:	maximum 360˚C
Duration:	maximum 3 sec.

We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical realys.

4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.

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