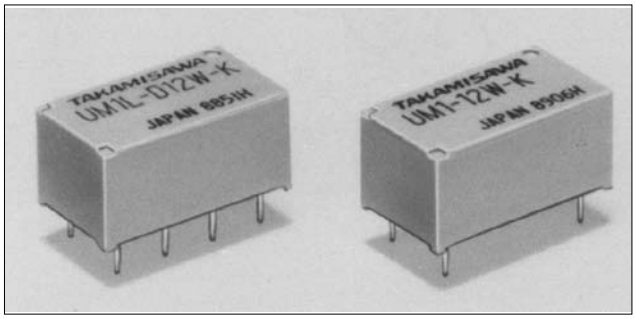
MINIATURE RELAY

1 POLE, 0.5A
(HIGH FREQUENCE SIGNAL SWITCHING)

UM1 SERIES

RoHS Compliant

■ FEATURES



- Subminiature polarized relay
- Excellent high frequency characteristics
  —Isolation : min. 60 dB
  —Insertion loss : max. 1 dB
  —V.S.W.R. : max. 1.2
  } at 900 MHz (Impedance of the measuring devices is 75Ω)
- High reliability — Bifurcated contacts
  — Movable contact: gold overlay
  — Stationary contact: gold clad
- Wide operating range
- DIL pitch terminals
- Plastic sealed type
- Latching type available
- RoHS compliant since date code: 0437T2
  Please see page 7 for more information

■ ORDERING INFORMATION

	UM1	L	–	D	12	W	–	K
[Example]	(a)	(b)		(c)	(d)	(e)		(f)

(a)	Series Name	UM1: UM1 Series
(b)	Operation Function	Nil : Standard type L : Latching type
(c)	Number of Coil	Nil : Single winding type D : Double winding type
(d)	Nominal Voltage	Refer to the COIL DATA CHART
(e)	Contact	W : Bifurcated type (cross bar)
(f)	Enclosure	K : Plastic sealed type

■ SPECIFICATIONS

Item			Standard Type	Single Winding Latching Type	Double Winding Latching Type
			UM1-( ) W-K	UM1L-( ) W-K	UM1L-D ( ) W-K
Contact	Arrangement		1 form C (SPDT)		
	Material		Gold clad (stationary contact), gold plate (movable contact)		
	Style		Bifurcated (cross bar)		
	Resistance (initial)		Maximum 100 mΩ		
	Rating (resistive)		10 mA 24 VDC 1 W (at 900 MHz)		
	Maximum Carrying Current		0.5 A		
	Maximum Switching Power		1 W (DC) 10 W (at 900 MHz)		
	Maximum Switching Voltage		30 VDC		
	Maximum Switching Current		100 mA		
	Minimum Switching Load*1		0.01 mA 10 mVDC		
Excellent High Frequency Character-istics	Isolation		Minimum 60 dB (at 900 MHz), impedance of the measuring devices is 75Ω		
	Insertion Loss		Maximum 1 dB (at 900 MHz), impedance of the measuring devices is 75Ω		
	V.S.W.R.		Maximum 1.2 (at 900 MHz), impedance of the measuring devices is 75Ω		
Coil	Nominal Power (at 20°C)		200 to 220 mW	200 mW	400 mW
	Operate Power (at 20°C)		100 to 110 mW	100 mW	200 mW
	Operating Temperature		–30°C to +80°C (no frost)		–30°C to +60°C (no frost)
Time Value	Operate (at nominal voltage)		Maximum 6 ms	Maximum 6 ms (set)	
	Release (at nominal voltage)		Maximum 5 ms	Maximum 6 ms (reset)	
Life	Mechanical		1×10^6 operations minimum		
	Electrical		3×10^5 operations minimum (at nominal load)		
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)		
		Endurance	10 to 55 Hz (double amplitude of 5.0 mm)		
	Shock Resistance	Misoperation	500 m/s^2 (11 ±1 ms)		
		Endurance	1,000 m/s^2 (6 ±1 ms)		
	Weight		Approximately 4 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

Item	Standard	Single latch	Double latch
Isolation (initial)	Minimum 1,000 MΩ (at 500VDC)		
Dielectric Strength	500VAC 1 min., (open contact / contact and shield terminals)		
	1,000VAC 1 min., (coil contact/ coil and shield terminals)		

■ COIL DATA CHART

MODEL		Nominal voltage	Coil resistance (±10%)	Must operate voltage*1	Must release voltage*1	Nominal power
Standard Type	UM1- 1.5 W-K	1.5 VDC	11.2Ω	+1.05 VDC	+0.08 VDC	200 mW
	UM1- 3 W-K	3 VDC	45 Ω	+2.1 VDC	+0.15 VDC	200 mW
	UM1- 4.5 W-K	4.5 VDC	101 Ω	+3.15 VDC	+0.23 VDC	200 mW
	UM1- 5 W-K	5 VDC	125 Ω	+3.5 VDC	+0.25 VDC	200 mW
	UM1- 6 W-K	6 VDC	180 Ω	+4.2 VDC	+0.3 VDC	200 mW
	UM1- 9 W-K	9 VDC	405 Ω	+6.3 VDC	+0.45 VDC	200 mW
	UM1- 12 W-K	12 VDC	720 Ω	+8.4 VDC	+0.6 VDC	200 mW
	UM1- 18 W-K	18 VDC	1,620 Ω	+12.6 VDC	+0.9 VDC	200 mW
	UM1- 24 W-K	24 VDC	2,880 Ω	+16.8 VDC	+1.2 VDC	200 mW
	UM1- 48 W-K	48 VDC	10,472 Ω	+33.6 VDC	+2.4 VDC	220 mW

Note: *1 Specified values are subject to pulse wave voltage.
All values in the table are measured at 20°C.

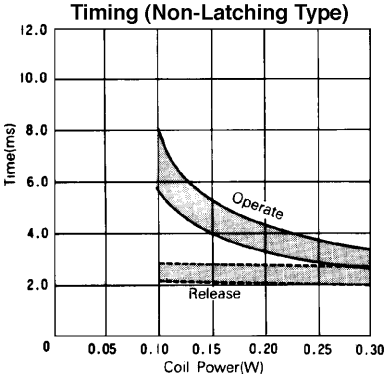
	MODEL	Nominal voltage	Coil resistance (±10%)	Set voltage*1	Reset voltage*1	Nominal power
Single Winding Latching Type	UM1L- 1.5 W-K	1.5 VDC	11.2Ω	+1.05 VDC	-1.05 VDC	200 mW
	UM1L- 3 W-K	3 VDC	45 Ω	+2.1 VDC	-2.1 VDC	200 mW
	UM1L- 4.5 W-K	4.5 VDC	101 Ω	+3.15 VDC	-3.15 VDC	200 mW
	UM1L- 5 W-K	5 VDC	125 Ω	+3.5 VDC	-3.5 VDC	200 mW
	UM1L- 6 W-K	6 VDC	180 Ω	+4.2 VDC	-4.2 VDC	200 mW
	UM1L- 9 W-K	9 VDC	405 Ω	+6.3 VDC	-6.3 VDC	200 mW
	UM1L- 12 W-K	12 VDC	720 Ω	+8.4 VDC	-8.4 VDC	200 mW
	UM1L- 18 W-K	18 VDC	1,620 Ω	+12.6 VDC	-12.6 VDC	200 mW
	UM1L- 24 W-K	24 VDC	2,880 Ω	+16.8 VDC	-16.8 VDC	200 mW
	UM1L- 48 W-K	48 VDC	11,520 Ω	+33.6 VDC	-33.6 VDC	200 mW
Double Winding Latching Type	UM1L-D1.5 W-K	1.5 VDC	P 5.6Ω	+1.05 VDC		400 mW
			S 5.6Ω		+1.05 VDC	
	UM1L-D 3 W-K	3 VDC	P 22.5Ω	+2.1 VDC		400 mW
			S 22.5Ω		+2.1 VDC	
	UM1L-D4.5 W-K	4.5 VDC	P 50.6Ω	+3.15 VDC		400 mW
			S 50.6Ω		+3.15 VDC	
	UM1L-D 5 W-K	5 VDC	P 62.5Ω	+3.5 VDC		400 mW
			S 62.5Ω		+3.5 VDC	
	UM1L-D 6 W-K	6 VDC	P 90 Ω	+4.2 VDC		400 mW
			S 90 Ω		+4.2 VDC	
	UM1L-D 9 W-K	9 VDC	P 202.5Ω	+6.3 VDC		400 mW
			S 202.5Ω		+6.3 VDC	
	UM1L-D 12 W-K	12 VDC	P 360 Ω	+8.4 VDC		400 mW
			S 360 Ω		+8.4 VDC	
	UM1L-D 18 W-K	18 VDC	P 810 Ω	+12.6 VDC		400 mW
			S 810 Ω		+12.6 VDC	
	UM1L-D 24 W-K	24 VDC	P 1,440 Ω	+16.8 VDC		400 mW
			S 1,440 Ω		+16.8 VDC	
	UM1L-D 48 W-K	48 VDC	P 5,760 Ω	+33.6 VDC		400 mW
			S 5,760 Ω		+33.6 VDC	

P: Primary coil S: Secondary coil

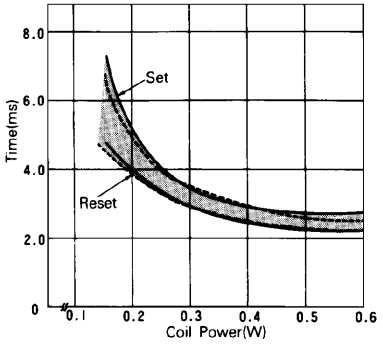
Note: *1 Specified values are subject to pulse wave voltage.
All values in the table are measured at 20°C.

■ CHARACTERISTIC DATA

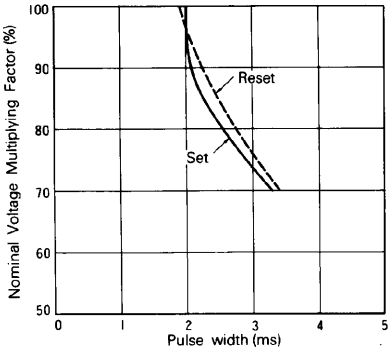
Timing (Non-Latching Type)



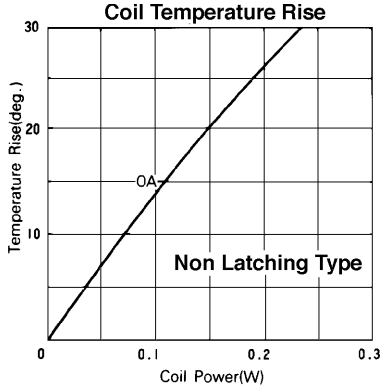
Timing (Latching Type)



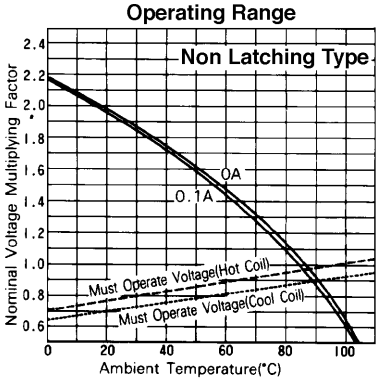
Pulse Characteristics(Latching Type)



Coil Temperature Rise

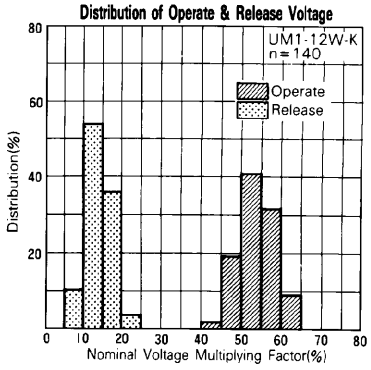


Operating Range

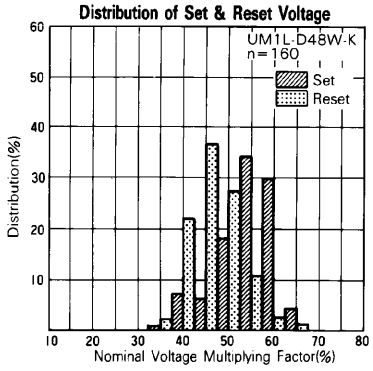


■ REFERENCE DATA

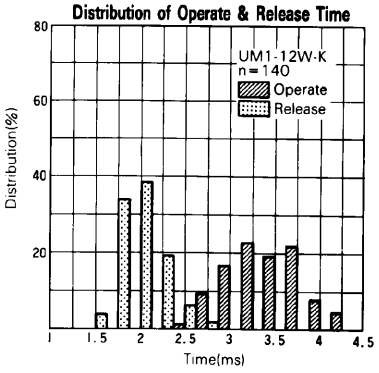
Distribution of Operate & Release Voltage



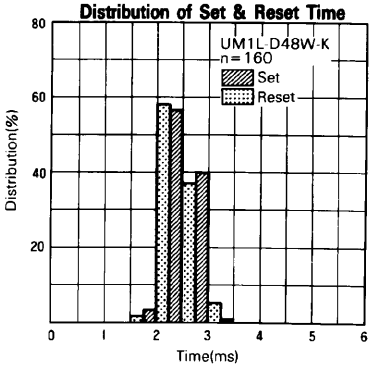
Distribution of Set & Reset Voltage



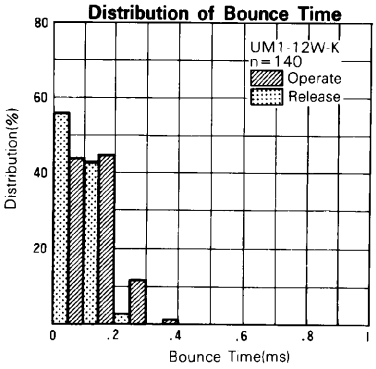
Distribution of Operate & Release Time



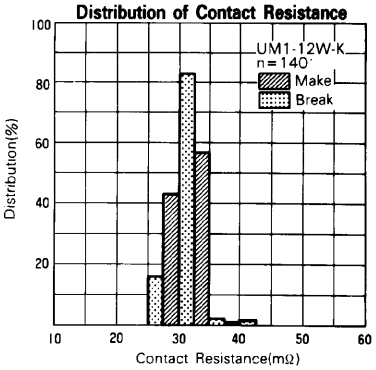
Distribution of Set & Reset Time

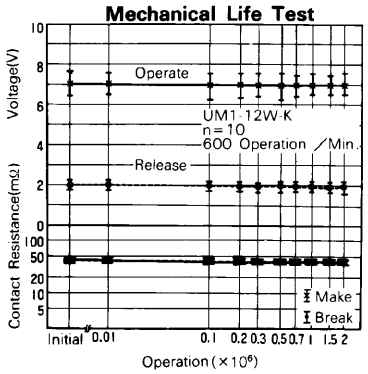


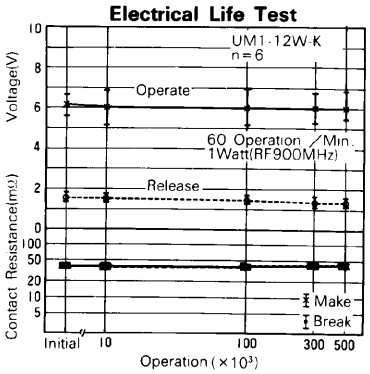
Distribution of Bounce Time

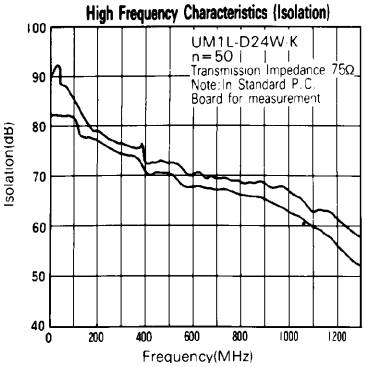


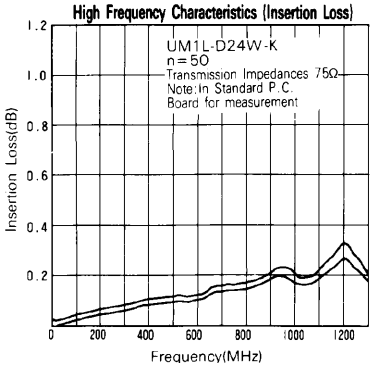
Distribution of Contact Resistance

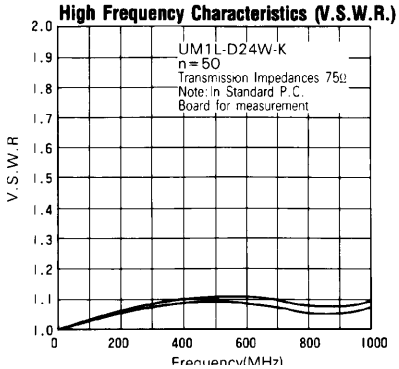








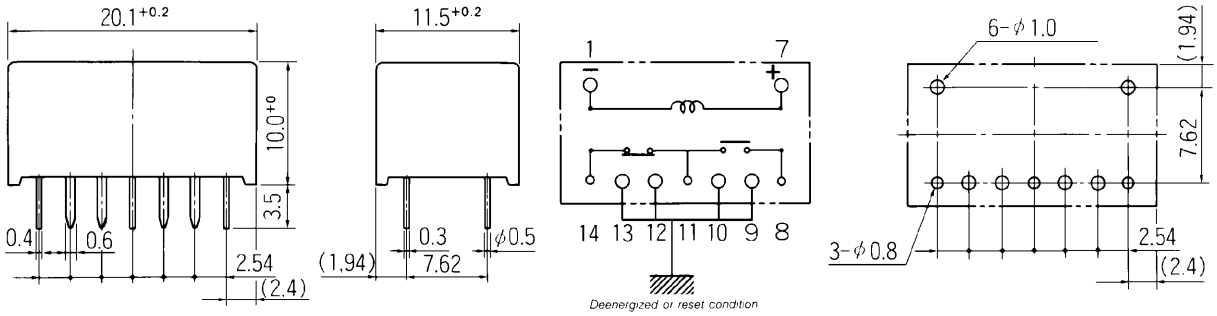




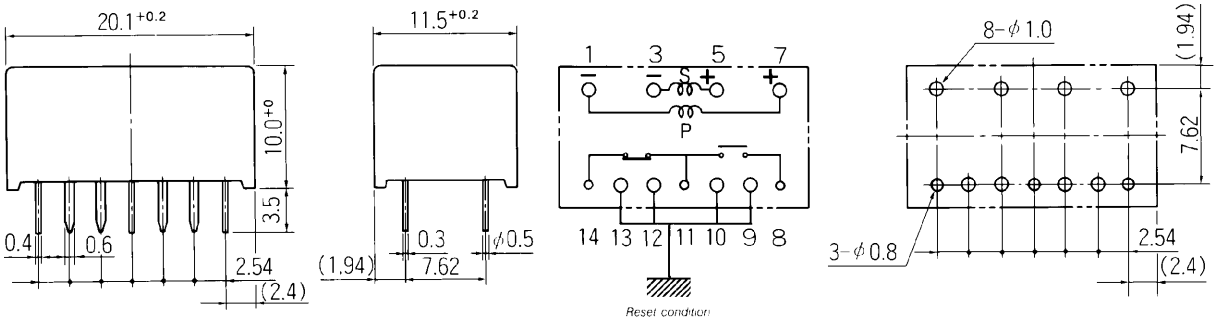
■ DIMENSIONS

- **Dimensions**
- **Schematics** (Bottom view)
- **PC board mounting hole layout** (Bottom view)

UM1, UM1L type (Non-latching type, single winding latching type)



UM1L-D type (Double winding latching type)



Unit: mm

RoHS Compliance and Lead Free Relay Information

1. General Information

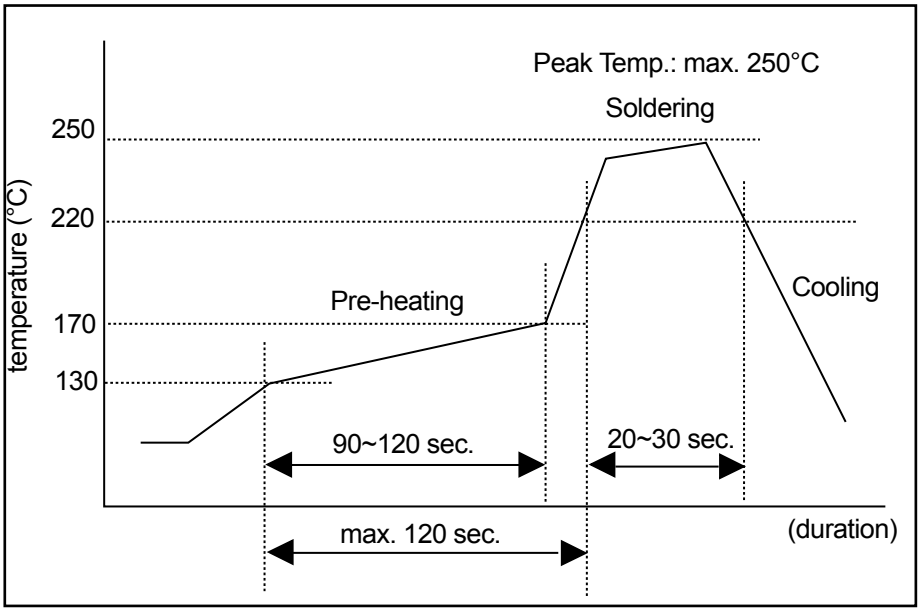
- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. All our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (http://www.fcai.fujitsu.com/pdf/LeadFreeLetter.pdf)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu. From February 2005 forward Sn-3.0Cu-Ni will be used for FTRB3 and FTR-B4 series relays.
- All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 6 hazardous materials that are restricted by RoHS directive (lead, mercury, cadmium, 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.

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu and Sn-3.0 Cu-Ni (only FTR-B3 and FTR-B4 from February 05)

Reflow Solder condition



Flow Solder condition:

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

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

5. Solid State Relays

- Each lead terminal will be changed from solder plating to Sn plating and Nickel plating. A layer of Nickel plating

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