Miniature Intermediate Power Relay	KML1, KML2

Features

- 1C: 15A, 2C: 10A switching capability
- Confirm to the CE low voltage directive
- Various terminals available
- Socket available
- 1 & 2 poles configurations
- UL insulation system: Class F(2 Form C)

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(File No.:E122258)

1. COIL DATA (at 23°C)

1) DC Type (1 Form C)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω)	Coil Power (W)
5	4.0	0.5	5.5	27.5 x (1±10%)	Approx. 0.9 to 1.1
6	4.8	0.6	6.6	40 x (1±10%)	
9	7.2	0.9	9.9	90 x (1±10%)	
12	9.6	1.2	13.2	160 x (1±10%)	
21	16.8	2.1	23.1	490 x (1±10%)	
24	19.2	2.4	26.4	650 x (1±10%)	
30	24.0	3.0	33.0	1000 x (1±10%)	
36	28.8	3.6	39.6	1440 x (1±10%)	
48	38.4	4.8	52.8	2600 x (1±15%)	
60	48.0	6.0	66.0	4000 x (1±15%)	
110	88.0	11.0	121.0	11000 x (1±15%)	
125	100	12.5	137.5	14000 x (1±15%)	
220	176	22.0	242.0	53750 x (1±15%)	

2) DC Type (2 Form C)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω)	Coil Power (W)
5	4.0	0.5	5.5	27.5 x (1±10%)	Approx. 0.9 to 1.1
6	4.8	0.6	6.6	40 x (1±10%)	
9	7.2	0.9	9.9	90 x (1±10%)	
12	9.6	1.2	13.2	160 x (1±10%)	
21	16.8	2.1	23.1	490 x (1±10%)	
24	19.2	2.4	26.4	640 x (1±10%)	
30	24.0	3.0	33.0	1000 x (1±10%)	
36	28.8	3.6	39.6	1440 x (1±10%)	
48	38.4	4.8	52.8	2560 x (1±15%)	
60	48	6.0	66.0	4000 x (1±15%)	
110[4)]	80	11.0	121	12250 x (1±15%)	
125	100	12.5	137.5	17360 x (1±15%)	
220	176	22.0	242	53360 x (1±15%)	

3) AC Type (1 Form C)

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.8	6.60	11.5 x (1±10%)	Approx. 1.2 to 1.8
12	9.60	3.6	13.2	46 x (1±10%)	
24	19.2	7.2	26.4	184 x (1±10%)	
36	28.8	10.8	39.6	410 x (1±10%)	
48	38.4	14.4	52.8	735 x (1±10%)	
60	48	18.0	66.0	1100 x (1±10%)	
120[4)]	96	36.0	132	4550 x (1±15%)	
200	160	66.0	220	12950 x (1±15%)	
220	176	72.0	242	14400 x (1±15%)	
240[4)]	176	72.0	264	14400 x (1±15%)	
277	221.6	83.1	304.7	23590 x (1±15%)	

4) AC Type (2 Form C)

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.8	6.60	11 x (1±10%)	Approx. 1.2 to 1.8
12	9.60	3.6	13.2	44 x (1±10%)	
24	19.2	7.2	26.4	177 x (1±10%)	
36	28.8	10.8	39.6	400 x (1±10%)	
48	38.4	14.4	52.8	708 x (1±10%)	
60	48.0	18	66	1100 x (1±10%)	
100	80.0	30	110	3400 x (1±15%)	
110[4)]	80.0	33	121	3400 x (1±15%)	
120[4)]	88.0	36	132	4080 x (1±15%)	
200	160	60	220	13600 x (1±15%)	
220[4)]	160	66	242	13600 x (1±15%)	
240[4)]	176	72	264	16300 x (1±15%)	
277	221.6	83.1	304.7	23590 x (1±15%)	

Notes:

1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) The data shown above are initial values.

3) Maximum allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

4) 110VAC: Nominal voltage 100~110VAC; 120VAC: Nominal voltage 110~120VAC; 220VAC: Nominal voltage 200~220VAC; 240VAC: Nominal voltage 220~240VAC; 110VDC: Nominal voltage 100~110VDC

2. CONTACT DATA

Contact Arrangement		1 Form C	2 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive load)		15A 250VAC / 30VDC	10A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC	
Max. Switching Current		15A	10A
Max. Switching Power		3750VA / 450W	2500VA / 300W
Life Expectancy	Electrical	100,000 operations	
	Mechanical	10,000,000 operations	

Note: The data shown above are initial values.

3. CHARACTERISTICS

Insulation Resistance		500MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	1500VAC 1min
	Contact Sets	1500VAC 1min
Operate Time (at nominal voltage)		25ms max.
Release Time (at nominal voltage)		25ms max.
Temperature Rise (no-load, at nominal voltage)		60K max.
Temperature Range		-40℃ ~ 70℃
Shock Resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration Resistance		10 ~ 55Hz 1mm DA
Humidity		5% ~ 85% RH
Termination		PCB, Plug-in
Construction		Dust protected
Weight (Approx.)		37g
Outline Dimension (L x W x H)		28.0 x 21.5 x 35.0mm

Notes: The data shown above are initial values.

4. SAFETY APPROVAL

UL / cUL	1 Form C	15A 250VAC / 30VDC
	2 Form C	10A 250VAC / 30VDC 1/3HP 240VAC / 120VAC

Notes:

1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

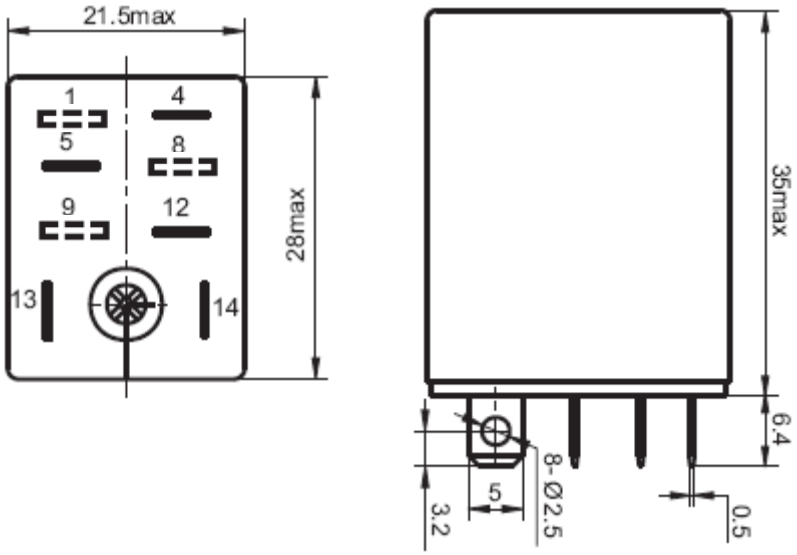
5. ORDERING INFORMATION

KML 1 - D24 P L ① ② ③ ④ ⑤	
① Relay Model	KML
② Contact Arrangement	1 : 1 Form C (SPDT) 2 : 2 Form C (DPDT)
③ Coil Voltage	DC: D5=5VDC, D6=6VDC, D9-9VDC, D12=12VDC, D21=21VDC, D24=24VDC, D30=30VDC, D36=36VDC, D48=48VDC, D60=60VDC, D110=110VDC, D125=125VDC, D220=220VDC AC: A6=6VAC, A12=12VAC, A24=24VAC,A36=36VDC, A48=48VAC, A60=60VAC, A100=100VAC, A110=110VAC, A120=120VDC, A200=200VAC, A220=220VAC, A240=240VAC, A277-277VAC
④ Terminal Form	P: PC board S: Plug-in B: Top mounting
⑤ Component Code	Nil: Without component D: With diode L: With LED DL: With LED and diode

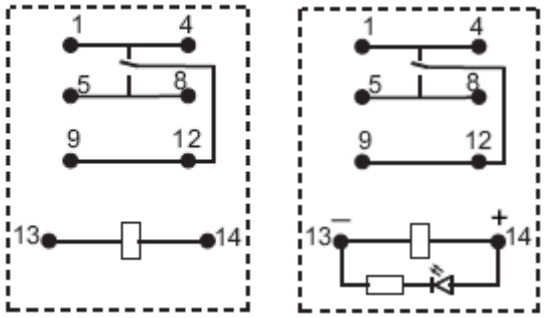
6. DIMENSIONS (Unit: mm)

1 Form C, Plug-in

Outline Dimensions



Wiring Diagram (Bottom View)

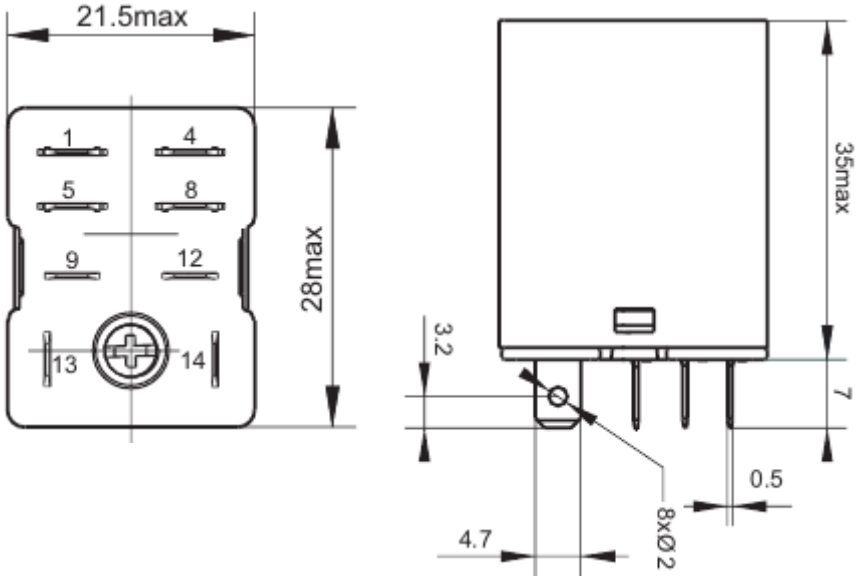


(With LED)

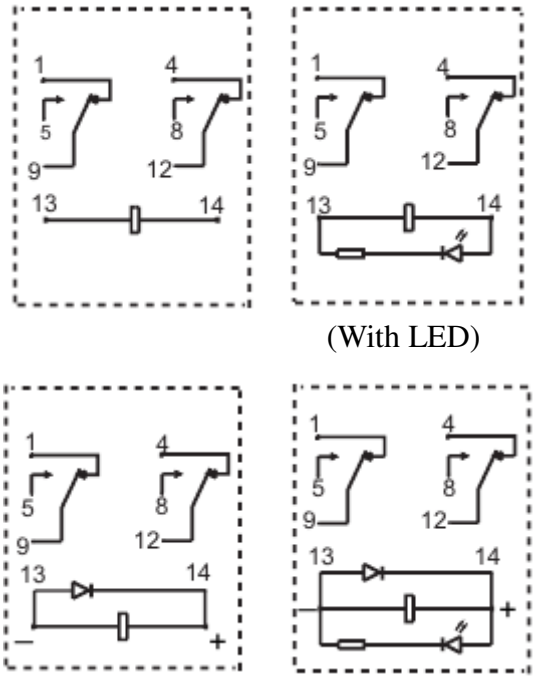
Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

2 Form C, Plug-in

Outline Dimensions



Wiring Diagram (Bottom View)



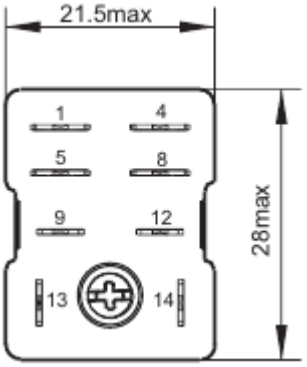
With free wheeling diode (DC type)

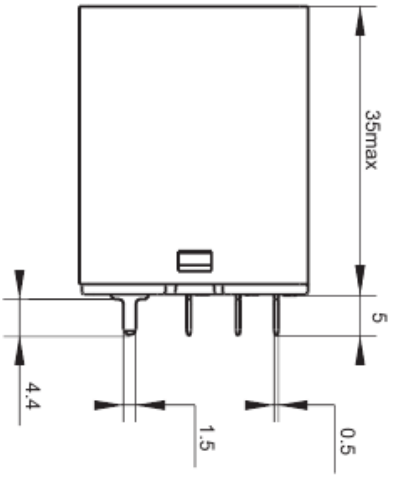
With light emitting diode and free wheeling diode (DC type)

Remark: Fly-wheel products need to distinguish between the cathodes. Only with LED products do not need to distinguish between the cathodes. Only DC relays have freewheeling diodes.

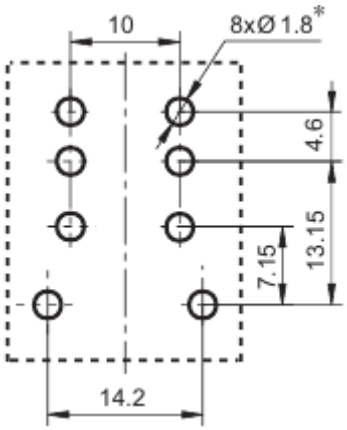
2 Form C, PC Board

Outline Dimensions

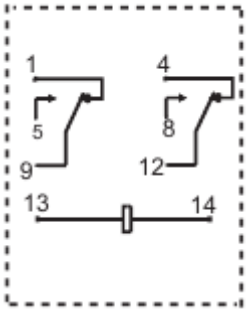


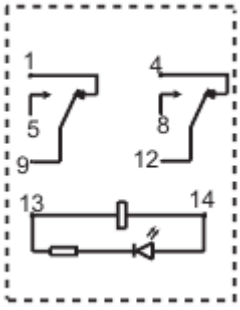


PCB Layout (Bottom view)

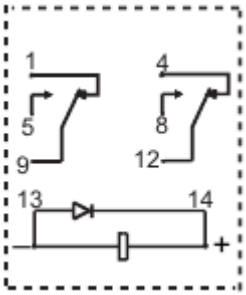


Wiring Diagram (Bottom View)

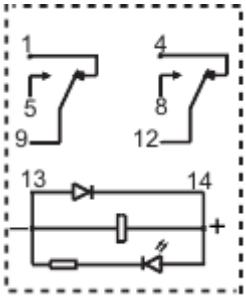




(With LED)



With free wheeling diode (DC type)

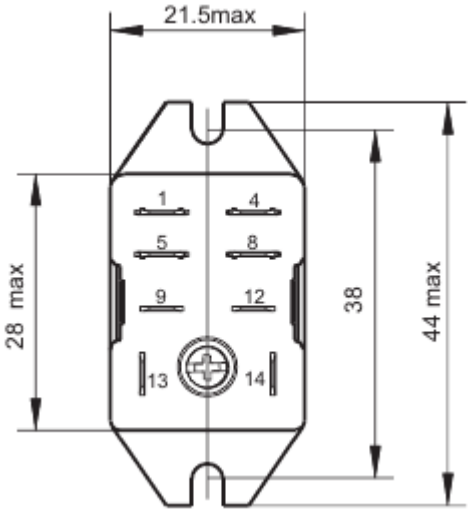


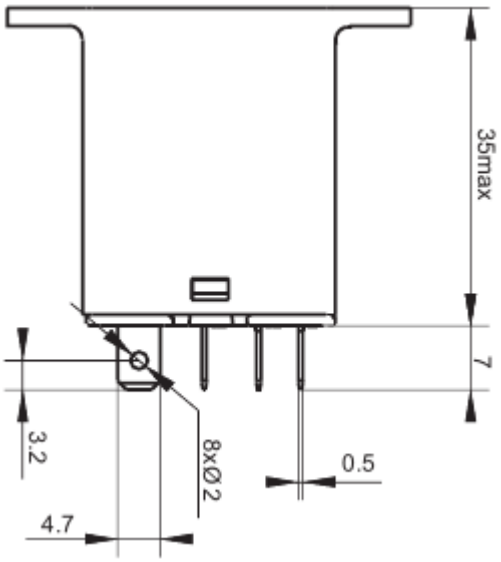
With light emitting diode and free wheeling diode (DC type)

Remark: Fly-wheel products need to distinguish between the cathodes. Only with LED products do not need to distinguish between the cathodes. Only DC relays have freewheeling diodes.

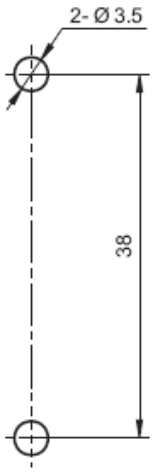
2 Form C, Top mounting

Outline Dimensions





Mounting Holes

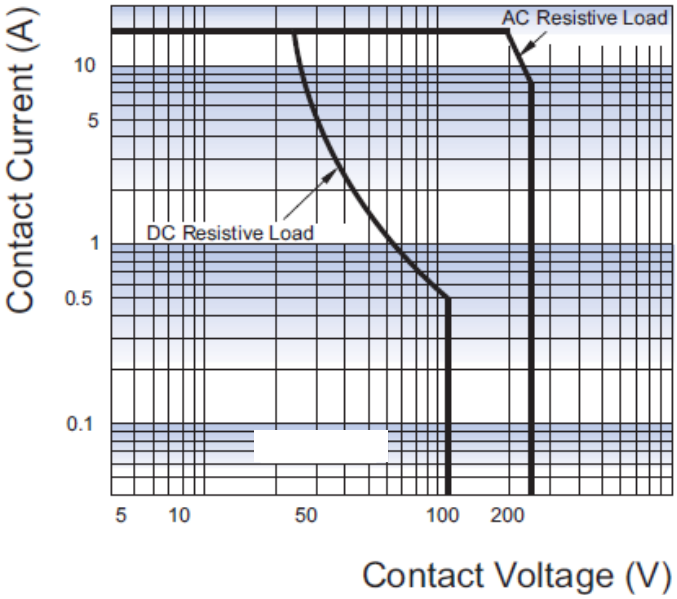


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

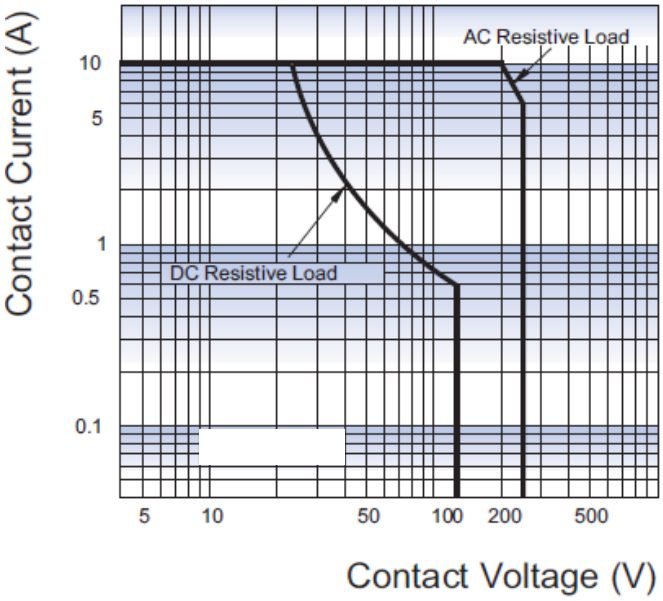
2) The tolerance without indicating for PCB layout is always ±0.1mm.

7. CHARACTERISTIC CURVES

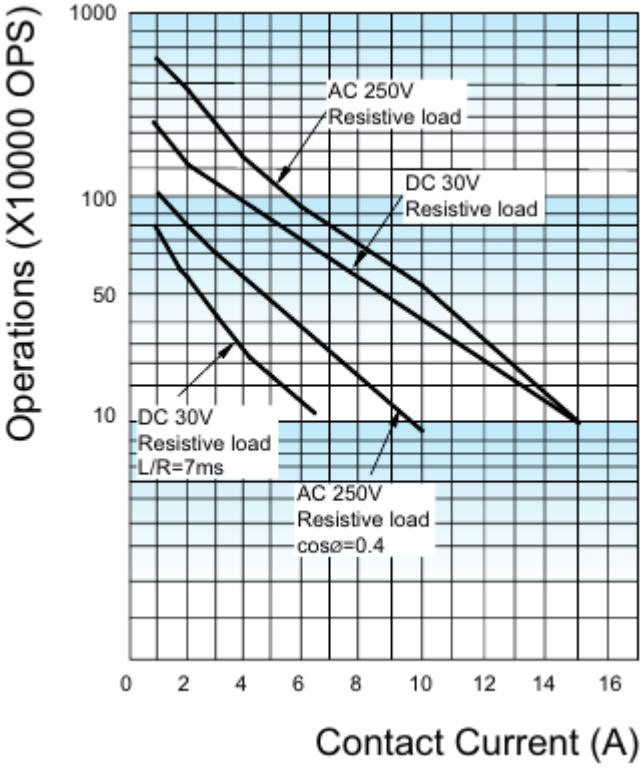
Maximum Switching Power (1 Form C)



Maximum Switching Power (2 Form C)



Endurance Curve (1 Form C)



Endurance Curve (2 Form C)