RoHS

EM Devices Corporation

AUTOMOTIVE RELAY / 50A TYPE

EM1K SERIES

<FEATURE>

- Large current capacity (81A 1hour at 20°C)
- High heat resistance
- Small size
- Flux tight housing
- Pb free
- Through-hole reflow soldering available

<APPLICATION>

- Power supply, Motor control such as fan and pumps, Heater control, CR circuit control, Lamp control

<PART NUMBER SYSTEM>

EM1K - 2 U 1 S

Type			
	Enclosure	Nil:	Unsealed
		S:	Sealed
	Must operate voltage	1:	6.5V
	Contact Material	U:	Silver oxide complex alloy (Standard)
		K:	Silver oxide complex alloy (High performance)
	Coil Resistance	2:	225Ω

Contact Form	Contact Material	Coil Nominal Voltage	Coil Resistance	Sealed Type	Unsealed Type
1 form U	Standard	12VDC	225Ω	EM1K-2U1S	EM1K-2U1
1 form U	High performance	12VDC	225Ω	EM1K-2K1S	EM1K-2K1

<COIL RATING>

(Ambient temperature: 20°C)

Coil Nominal Voltage	Nominal Operating Power	Coil Resistance (±10%)	Must Operate Voltage (1)	Must Release Voltage (1)
12VDC	0.64W	225Ω	6.5VDC	0.9VDC

(1) Test by pulse voltage

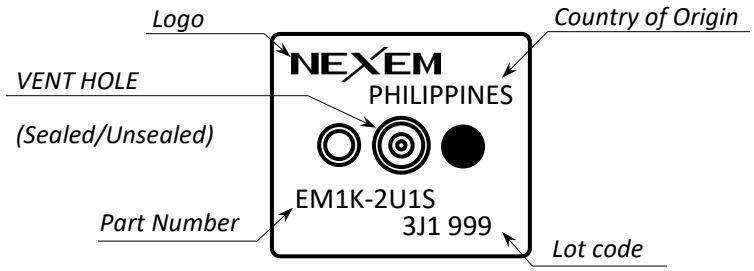
<SPECIFICATIONS>

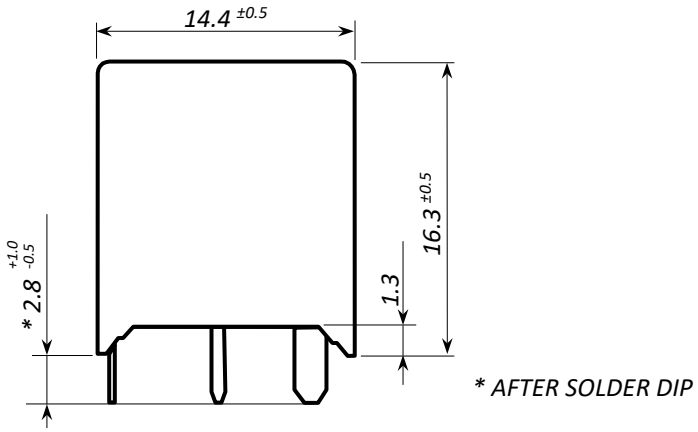
(Ambient temperature: 20°C)

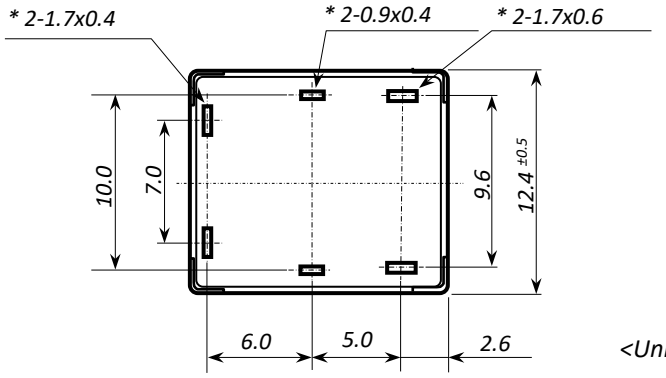
Items		Specifications	
		Standard	High performance
Contact form		1 form U	
Contact rating	Max. switching voltage (2)	16Vdc	
	Max. switching current (2)	100A ON / 60A OFF at 14Vdc	
	Min. switching current	1A at 5Vdc	
	Max. carrying current (3)	81A at 14Vdc for 1hour (20°C)	
	Contact resistance	2.5mΩ typical, 25mΩ max. (6Vdc–7A voltage drop method, initial)	
	Rated load	40A-14Vdc, Resistive load	50A-14Vdc, Resistive load
Contact material		Silver oxide complex alloy	
Operate time (4)		10ms max.	
Release time (4)		10ms max.	
Insulation resistance		100MΩ min. at 500Vdc	
Breakdown voltage	Between open contacts	500Vac min. for 1minute	
	Between coil and contact	500Vac min. for 1minute	
Shock resistance	Misoperation	98m/s^2	
	Destructive failure	980m/s^2	
Vibration resistance	Misoperation	10 to 300Hz, 43m/s^2	
	Destructive failure	10 to 500Hz, 43m/s^2 for 200hours	
Ambient temperature		-40 to +125°C (no freezing and condensation)	
Life expectancy	Mechanical	1,000,000 cycles	
	Electrical	100,000 cycles (Rated load)	
Weight		8g typical	

(2) Resistive, 10cycles
(3) Copper thickness: 105µm, width: 15mm
(4) Excluding contact bounce, nominal voltage applied, without flywheel coil diode

<DIMENSIONS>

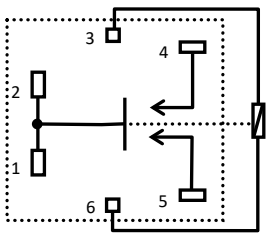


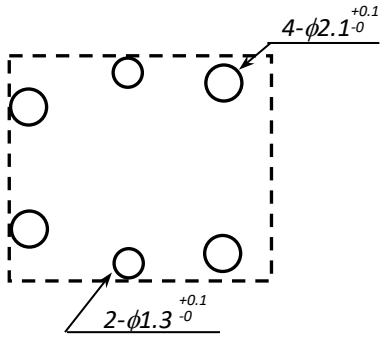




<Unit: mm>

<SCHEMATIC AND PCB PAD LAYOUT (BOTTOM VIEW)>





<Unit: mm>

<NOTICE>

- All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact EM Devices for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read “AUTOMOTIVE POWER RELAY USER’S MANUAL” in web site. (https://www.em-devices.com/en/)
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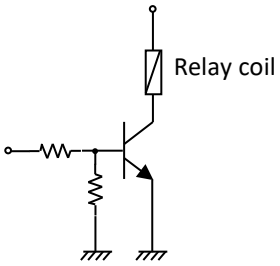
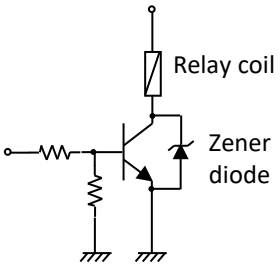
<COIL DRIVE CIRCUIT>

Recommended Circuit



(a)



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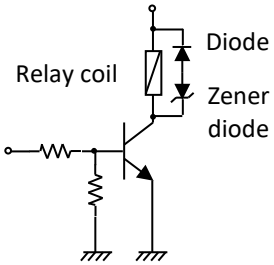
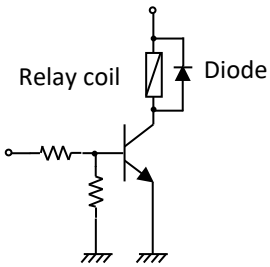


(c)

Non-recommended Circuit



(d)

EM Devices recommends coil drive circuit (b) and (c) for coil fly back suppression, but does not recommend the circuit (d) because the performance of the EM1K relay does not appear enough.