DATA SHEET

NEC/TOKIN

AUTOMOTIVE RELAYS

EP2/EP1 SERIES

DESCRIPTION

The NEC TOKIN EP2 / EP1 series are PC-board mount type automotive relays suitable for various motor controls and other applications that require a high level of quality and performance.

EP2 series is a twin-relay and divided into two types for different usage.

One is an H-bridge type designed for forward and reverse control of the motors, and the other, a separate type containing two separated relays in one package.

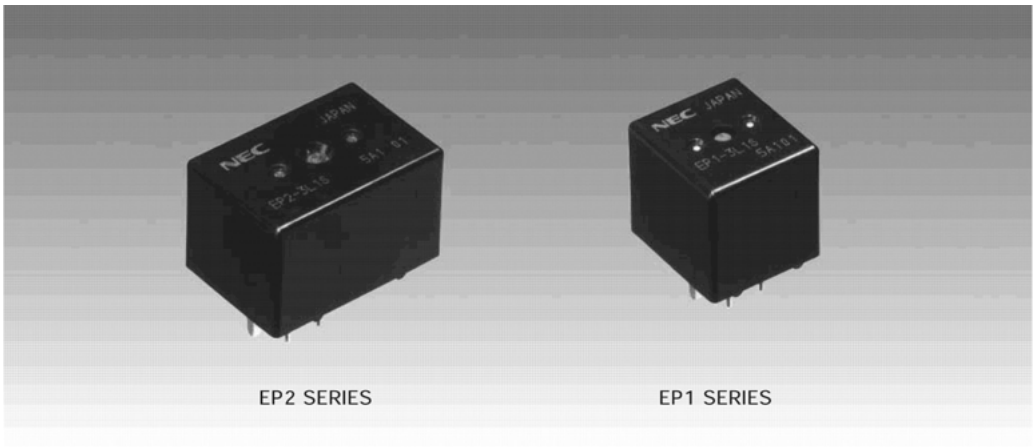
EP1 series is a 1 Form c relay equivalent to EP2 series in performance.

FEATURES

- For motor reversible control and solenoid control
- Approx. 50% less relay space than conventional relay
- High performance and productivity by unique structure
- Flux tight housing

APPLICATIONS

- Power window
- Antenna lifter
- Auto-seat positioning
- Electrical door lock
- Passive seat belt control
- Keyless/Remote entry system
- Sliding roof control



The information in this document is subject to change without notice.

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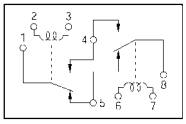
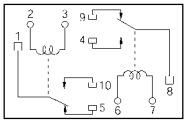
Printed in Japan

SCHEMATIC (BOTTOM VIEW)

EP2 SERIES

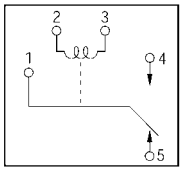


[H Bridge Type]



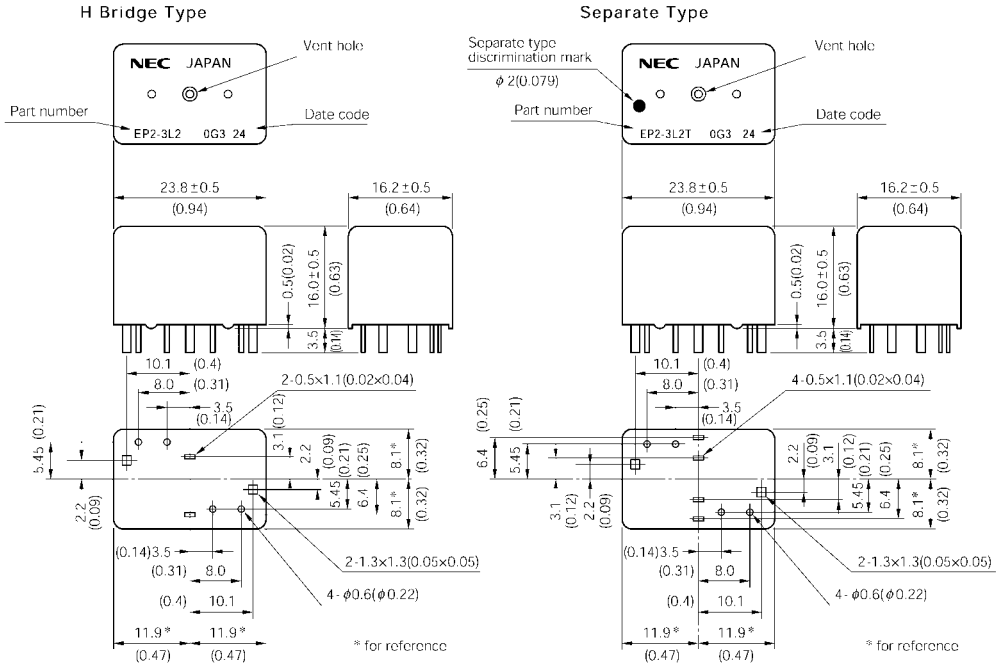
[Separate Type]

EP1 SERIES

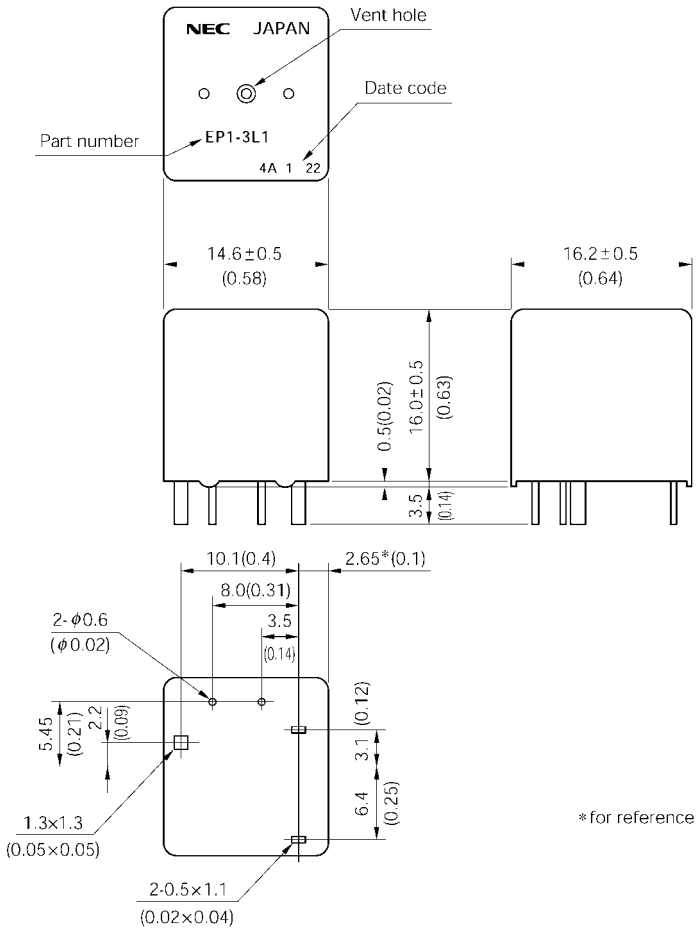


DIMENSIONS mm (inch)

EP2 SERIES

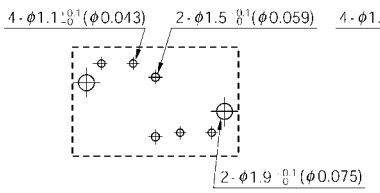


EP1 SERIES

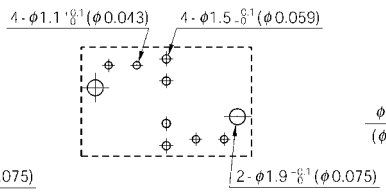


PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

EP2 SERIES

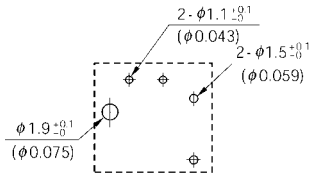


[H Bridge Type]



[Separate Type]

EP1 SERIES



SPECIFICATIONS

at 25°C(77°F)

Items		EP2	EP1
Contact Form		1 Form c × 2 (H bridge type and separate type)	1 Form c
Contact Material		Silver oxide complex alloy(special type available)	
Contact Resistance		50 mΩ max. (measured at 7 A) initial	
Contact Switching Voltage		16 Vdc max.	
Contact Switching Current		25 A max. (at 16 Vdc)	
Contact Carrying Current		20 A max. (1 hour max.), 25 A max. (2 minutes max.) at 12 Vdc	25 A max. (1 hour max.), 30 A max. (2 minutes max.) at 12 Vdc
Operate Time		Approx. 5 ms (at 12 Vdc) initial	
Release Time		Approx. 2 ms (at 12 Vdc) initial. without diode	
Normal Operate Power		0.48 W / 0.64 W (at 12 Vdc)	
Insulation Resistance		100 MΩ min. (at 500 Vdc) initial	
Breakdown Voltage		500 Vdc min. (for 1 minute) initial	
Shock Resistance		98 m / s^2 [10 G] min. (misoperating), 980 m / s^2 [100 G] min. (destructive failure)	
Vibration Resistance		10 to 300 Hz, 43 m/s^2 [4.4 G] min. (misoperating) 10 to 500 Hz, 43 m/s^2, [4.4 G] 200 hours (destructive failure)	
Ambient Temperature		–40 °C to +85 °C (–40 °F to +185 °F)	
Coil Temperature		50 °C / W (122 °F/W)(contact carrying current 0 A)	
Life Expectancy	Mechanical	1 × 10^6 operations	
	Electrical	100 x 10^3 operations (at 14 Vdc. Motor Load 20 A / 3 A)	
Weight		Approx. 15 gn (0.53oz)	Approx. 8 gr (0.28 oz)

COIL RATING

EP2 SERIES

at 25°C(77°F)

Part Number		Nominal Voltage (Vdc)	Coil Resistance (Ω ±10%)	Nominal Current (mA)	Must Operate Voltage (Vdc max.)	Must Release Voltage (Vdc min.)	Nominal Operate Power (W)
H Bridge Type	Separate Type						
EP2-3L1	EP2-3L1T	12	225	53.5	6.5	0.9	0.64
EP2-3L2	EP2-3L2T	12	225	53.5	7.0	0.9	0.64
EP2-3L3	EP2-3L3T	12	225	53.5	7.5	0.9	0.64
EP2-4L3	EP2-4L3T	12	300	40.0	7.5	0.9	0.48
EP2-4L4	EP2-4L4T	12	300	40.0	8.0	0.9	0.48
EP2-4L5	EP2-4L5T	12	300	40.0	8.5	0.9	0.48

* High carrying current type available

EP1 SERIES

Part Number		Nominal Voltage (Vdc)	Coil Resistance (Ω ±10%)	Nominal Current (mA)	Must Operate Voltage (Vdc max.)	Must Release Voltage (Vdc min.)	Nominal Operate Power (W)
Regular Type	High Carrying Current Type						
EP1-3L1	EP1-B3G1	12	225	53.3	6.5	0.9	0.64
EP1-3L2	EP1-B3G2	12	225	53.3	7.0	0.9	0.64
EP1-3L3	EP1-B3G3	12	225	53.3	7.5	0.9	0.64
EP1-4L3	EP1-B4G3	12	300	40.0	7.5	0.9	0.48
EP1-4L4	EP1-B4G4	12	300	40.0	8.0	0.9	0.48
EP1-4L5	EP1-B4G5	12	300	40.0	8.5	0.9	0.48

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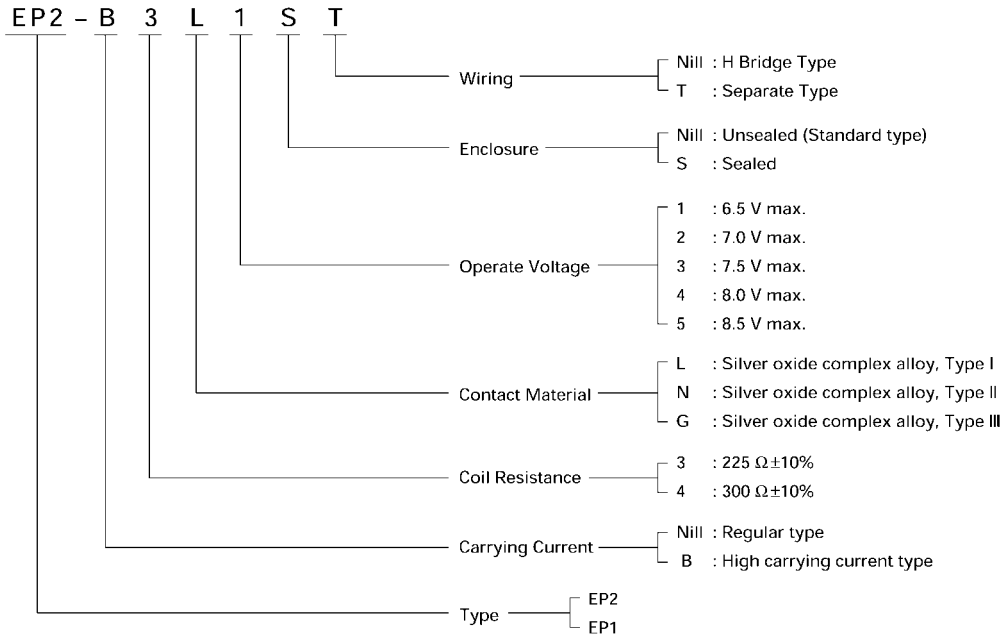
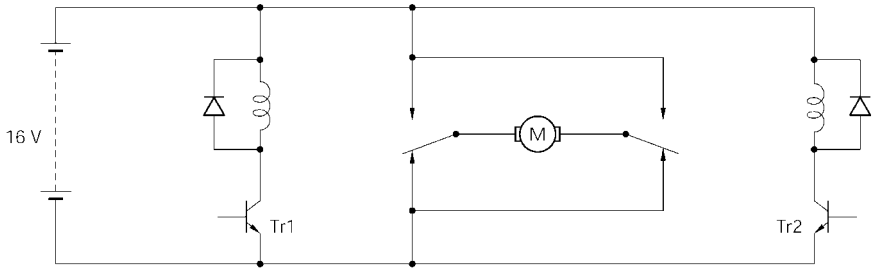
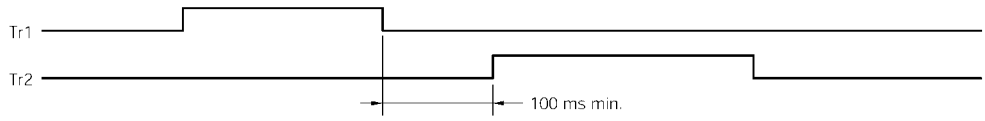
NUMBERING SYSTEM



TYPICAL APPLICATION (H Bridge Type)



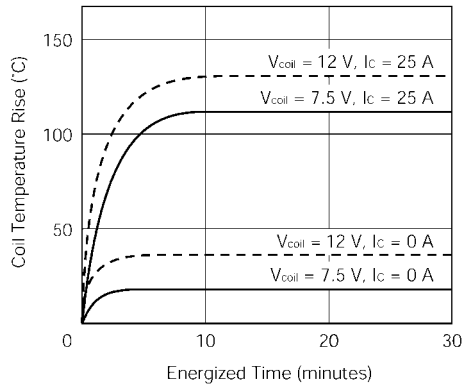
MOTOR	Tr1	Tr2
STOP	off	off
FORWARD	on	off
REVERSE	off	on

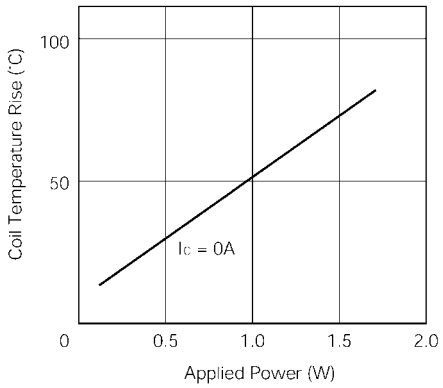


It is necessary to take more than 100 ms intervals for on / off timing between driving Tr1 and Tr2. If the interval is less than 100 ms, an excessive current happen to flow to the relay contacts.

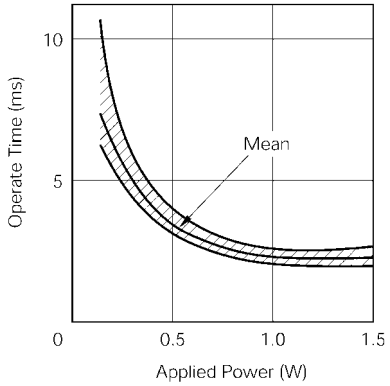
TECHNICAL DATA

Coil Temperature Rise (EP2-3L1)

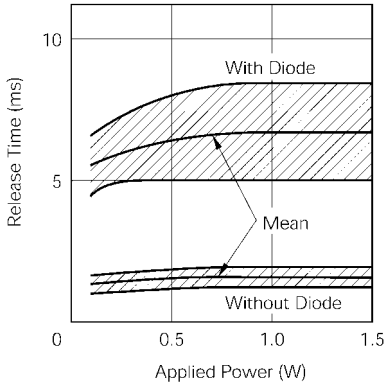




Operate Time (EP2-3L1)



Release time (EP2-3L1)



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KEMET:

EP2-3N1S EP2-3N1ST EP2F-B3N1ST EP1-B3G1S EP1-3N1S