# **DATA SHEET**



# AUTOMOTIVE TWIN RELAYS EN2 SERIES

## DESCRIPTION

Automotive twin relay EN2 series is Printed Circuit Board mount type and the most suitable for various motor controls in the automobiles which require high-quality and high-performance.

EN2 series has two types for different usage.

One is H bridge type which is designed for forward and reverse control of the motors.

The other is separate type which contains two separated relays in one package.

# **FEATURES**

- O Twin relay for motor & solenoid reversible control.
- O 30 % less relay space than conventional 2 relays.
- O High performance & productivity by unique symmetrical structure.
- O Fluxtight housing.

# **APPLICATIONS**

- O Power window
- O Power antenna
- O Central door interlock (Electrical door lock)
- O Auto-seat positioning
- O Passive seat belts
- O Keyless/Remote entry system
- O power sunroof



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#### SPECIFICATIONS

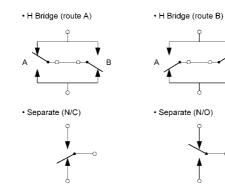
	ypes(Contact Rating)	EN2-	EN2-B			
Items		(Standard)	(High Current)			
Contact Form		1 Form c × 2 (H Bridge Type or Separate Type)				
Contact Material		Silver oxide complex alloy				
Initial Contact Resistance ★ figure 1.		H Bridge (route A) : 8.1 mΩtyp. H Bridge (route B) : 7.8 mΩtyp. Separate (N/C) : 3.9 mΩtyp. Separate (N/O) : 3.9 mΩtyp. (measured by voltage drop at 12 Vdc, 7A)	H Bridge (route A) : 4.9 mΩtyp. H Bridge (route B) : 4.6 mΩtyp. Separate (N/C) : 2.3 mΩtyp. Separate (N/O) : 2.3 mΩtyp. (measured by voltage drop at 12 Vdc, 7A)			
Contact Switching Voltage		16 Vdc				
Contact Switching Current		35 A Max. (at 16 Vdc)				
Contact Carrying Current		25 A Max. (1 hour Max.), 30 A Max. (2 minutes Max.) at 12 Vdc	35 A Max. (1 hour Max.), 40 A Max. (2 minutes Max.) at 12 Vdc			
Operate Time (Excluding bounce)		Approx. 5 ms (at Nominal Voltage)				
Release Time (Excluding bounce)		Approx. 2 ms (at Nominal Voltage), without diode				
Nominal Operate Power		0.64 W/0.8 W/1.15 W (at 12 Vdc)				
Insulation Resistance		100 M $\Omega$ at 500 Vdc, initial				
Withstand Voltage, Breakdown Voltage		500 Vac (for 1 minute), initial				
Shock Resistance		98 m/s <sup>2</sup> (misoperating), 980 m/s <sup>2</sup> (destructive failure)				
Vibration Resistance		10 to 300 Hz, 43 m/s <sup>2</sup> (misoperating) 10 to 500 Hz, 43 m/s <sup>2</sup> , 200 hours(destructive failure)				
Ambient Temperature		–40 to +85 °C (–40 to +185 °F)				
Coil Temperature Rise		50 °C / W (122 °F/W)				
Life Expectancy	Mechanical	1 × 10 <sup>6</sup> operations				
	Electrical	100 × 10 <sup>3</sup> operations (at 14 Vdc, Motor Load 30A17A)				
Weight		Approxi.18 g (0.63oz)				

## COIL RATING

Part Number		Nominal	Coil	Must	Must	Nominal
H Bridge Type	Separate Type	Voltage (V.DC)	Resistance $(\Omega \pm 10\%)$	Operate Voltage* (V.DC)	Release Voltage* (V.DC)	Operate Power (W)
EN2-1N1	EN2-1N1T	12	125	6.5	0.6	1.15
EN2-1N2	EN2-1N2T	12	125	7.0	0.6	1.15
EN2-2N3	EN2-2N3T	12	180	7.5	0.6	0.8
EN2-2N4	EN2-2N4T	12	180	8.0	0.6	0.8
EN2-3N4	EN2-3N4T	12	225	8.0	0.9	0.64
EN2-3N5	EN2-3N5T	12	225	8.5	0.9	0.64

\* Test by pulse voltage

#### ★ CONTACT RESISTANCE (figure 1)

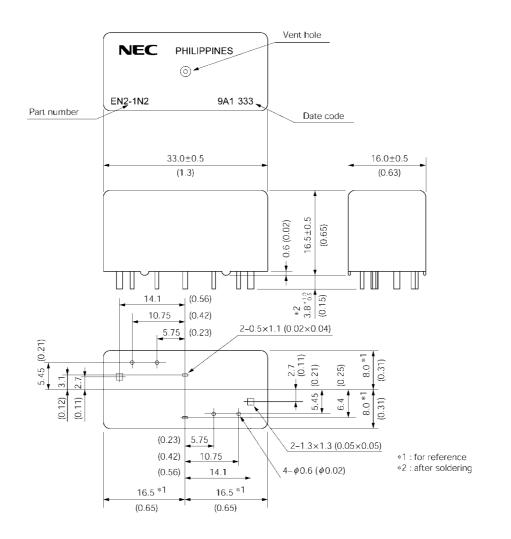


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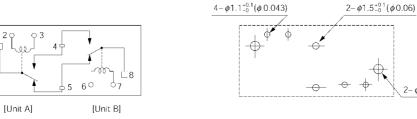
#### [H Bridge Type] **DIMENSION** mm (inch)



SCHEMATIC (BOTTOM VIEW)

PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

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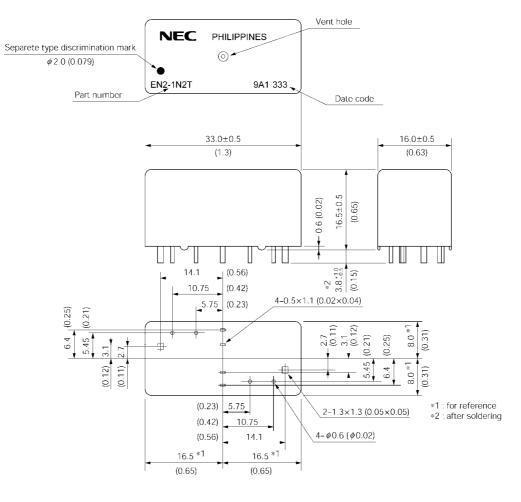
 $2-\phi 1.9^{+0.1}_{-0}(\phi 0.075)$ 

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#### [Separate Type] DIMENSION mm (inch)



#### SCHEMATIC (BOTTOM VIEW)

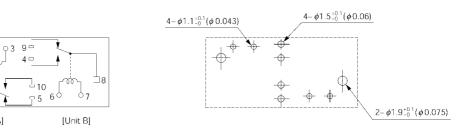
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[Unit A]

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#### PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

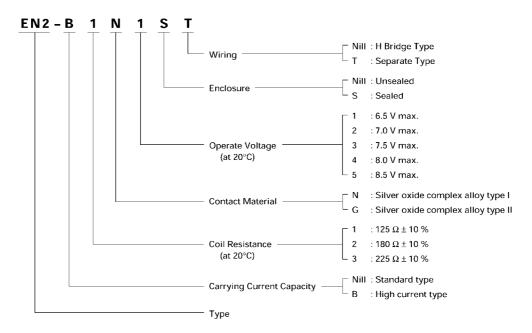


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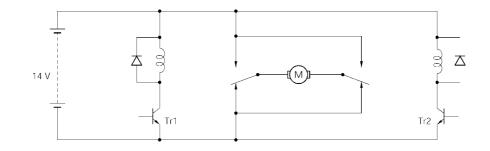
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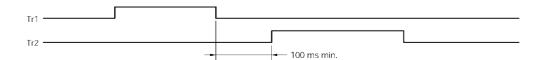
#### NUMBERING SYSTEM



### TYPICAL APPLICATION (H Bridge Type)



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



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