DATA SHEET

NEC/TOKIN

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

- $\ensuremath{\,\circ\,}$ 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



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

Date Published August 2002 M Printed in Japan

© NEC TOKIN Corporation 2002

À

- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin 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 "Precautions" and other safety precautions listed in the printed version catalog.



SPECIFICATIONS

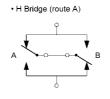
Types(Contact Rating)		EN2-	EN2-B		
tems		(Standard) (High Current)			
Contact Form		1 Form c × 2 (H Bridge Type or Separate Type)			
Contact Material		Silver oxide complex alloy			
Initial Contact Resistance ★ figure 1.		H Bridge (route A) : 8.1 mΩtyp. H Bridge (route B) : 7.8 mΩtyp. Separate (N/C) : 3.9 mΩtyp. Separate (N/O) : 3.9 mΩtyp. (measured by voltage drop at 12 Vdc, 7A)	H Bridge (route A) : 4.9 m Ω typ. H Bridge (route B) : 4.6 m Ω typ. Separate (N/C) : 2.3 m Ω typ. Separate (N/O) : 2.3 m Ω typ. (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 MΩ at 500 Vdc, initial			
Withstand Voltage, Breakdown Voltage		500 Vac (for 1 minute), initial			
Shock Resistance		98 m/s ² (misoperating), 980 m/s ² (destructive failure)			
Vibration Resistance		10 to 300 Hz, 43 m/s ² (misoperating) 10 to 500 Hz, 43 m/s ² , 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 ⁶ operations			
	Electrical	100 × 10 ³ 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)



• H Bridge (route B)







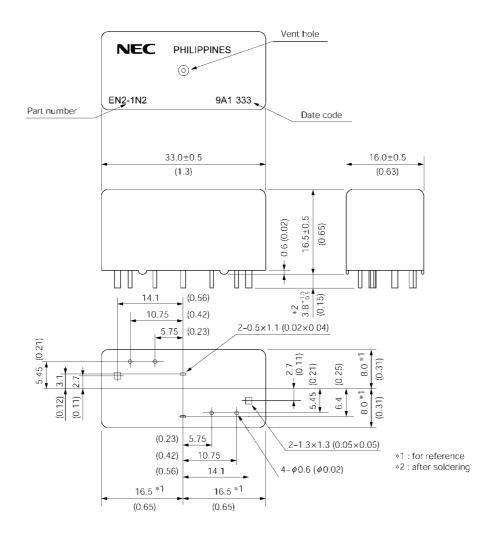
• Separate (N/O)





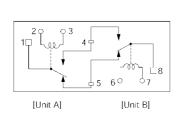
- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- •Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

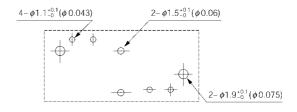
[H Bridge Type] DIMENSION mm (inch)



SCHEMATIC (BOTTOM VIEW)

PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

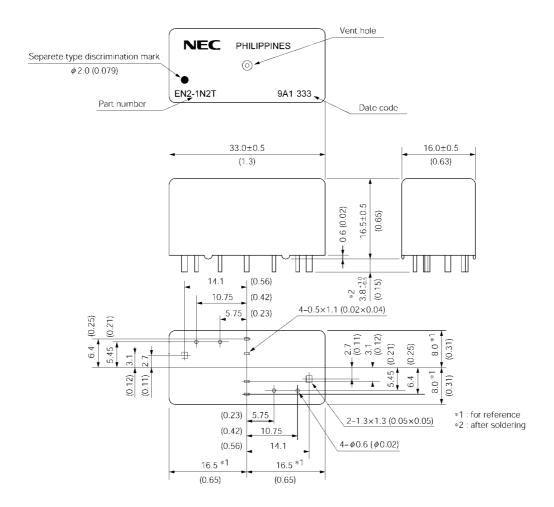




- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin for updated product data.
- $\ensuremath{\bullet}$ Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

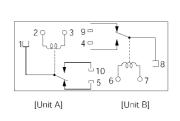


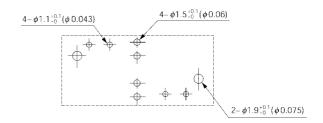
[Separate Type] DIMENSION mm (inch)



SCHEMATIC (BOTTOM VIEW)

PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)



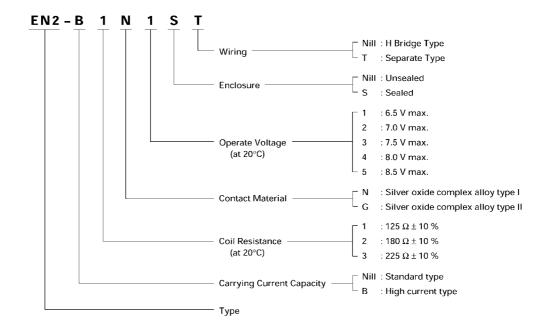




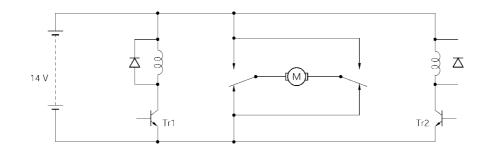
- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

NUMBERING SYSTEM

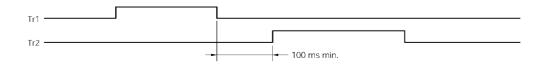
NEC/TOKIO



TYPICAL APPLICATION (H Bridge Type)



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



5

- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin for updated product data.
- $\ensuremath{\bullet}$ Please request for a specification sheet for detailed product data prior to the purchase.
- •Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC/TOKIN Corporation. NEC/TOKIN Corporation assumes no responsibility for any errors which may appear in this document.

NEC/TOKIN Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC/TOKIN Corporation or others. While NEC/TOKIN Corporation has been making continuous effort to enhance the reliability of its electronic components, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC/TOKIN electronic component, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features. NEC/TOKIN devices are classified into the following three quality grades:

are classified into the following three quality grades:
"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a
customer designated "quality assurance program" for a specific application. The recommended applications of a
device depend on its quality grade, as indicated below. Customers must check the quality grade of each device
before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed

for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life

support systems or medical equipment for life support, etc.

The quality grade of NEC/TOKIN devices is "Standard" unless otherwise specified in NEC/TOKIN's Data Sheets or Data Books. If customers intend to use NEC/TOKIN devices for applications other than those specified for Standard quality grade, they should contact an NEC/TOKIN sales representative in advance.

(Note

- (1) "NEC/TOKIN" as used in this statement means NEC/TOKIN Corporation and also includes its majorityowned subsidiaries.
- (2) "NÉC/TOKIN electronic component products" means any electronic component product developed or manufactured by or for NEC/TOKIN (as defined above).

DE0202

Printed on recycled paper

A

- •All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC Tokin 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 "Precautions" and other safety precautions listed in the printed version catalog.