

AUTOMOTIVE RELAYS EP2S/EP1S SERIES

LOW SOUND PRESSURE

DESCRIPTION

The NEC EP2S / EP1S 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.

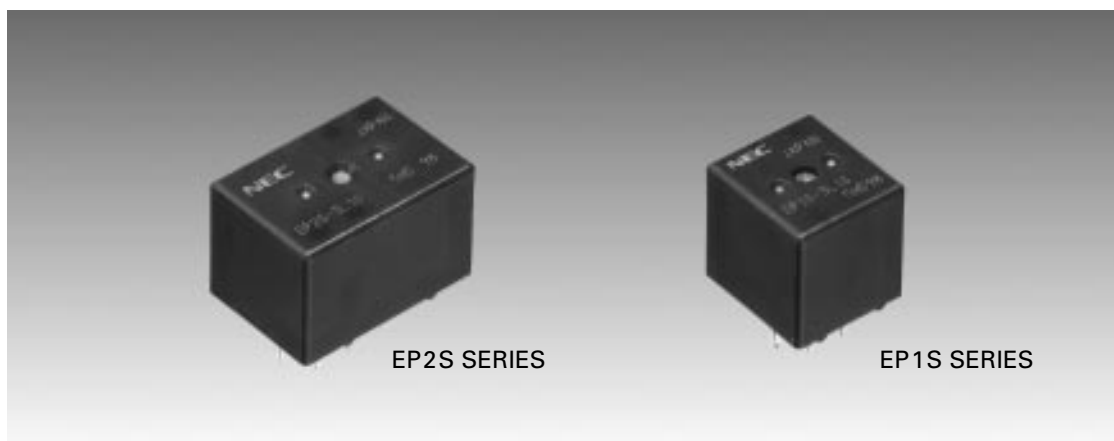
The sound pressure level of EP2S / EP1S series is 57 dBA nominal when the relay operates, and 49 dBA nominal when the relay releases.

FEATURES

- Less sound pressure (–10 dB at “operate” and –3 dB at “release” compared with EP2 / EP1)
- For motor and solenoid reversible control
- High performance and productivity by unique structure
- Flux tight housing

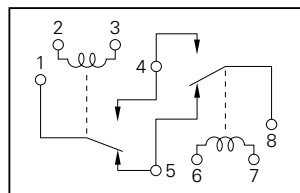
APPLICATION

- Power window control
- Electrical door lock
- Wiper system



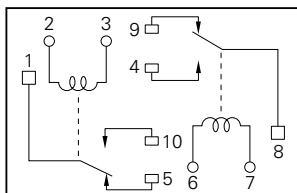
SCHEMATIC (BOTTOM VIEW)

EP2S SERIES



[Unit A] [Unit B]

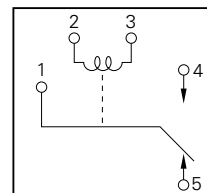
[H Bridge Type]



[Unit A] [Unit B]

[Separate Type]

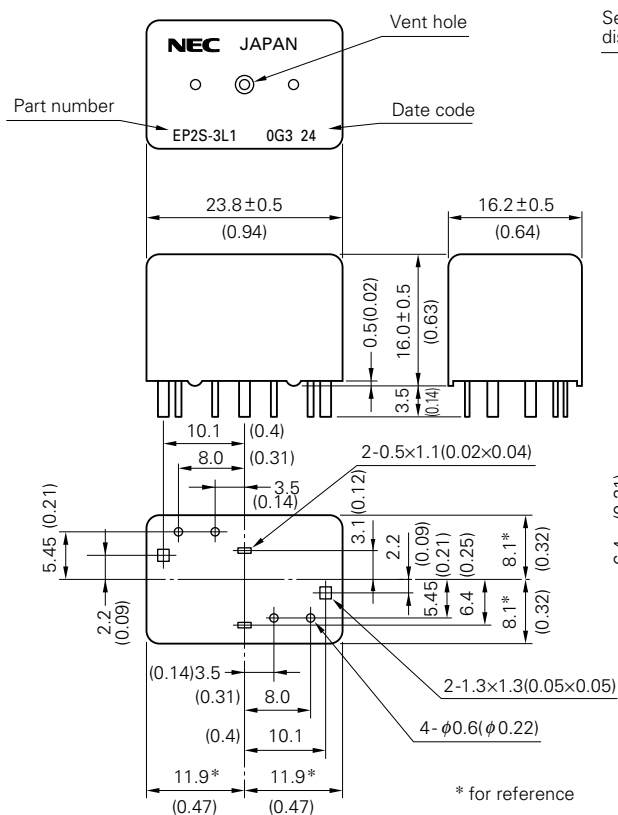
EP1S SERIES



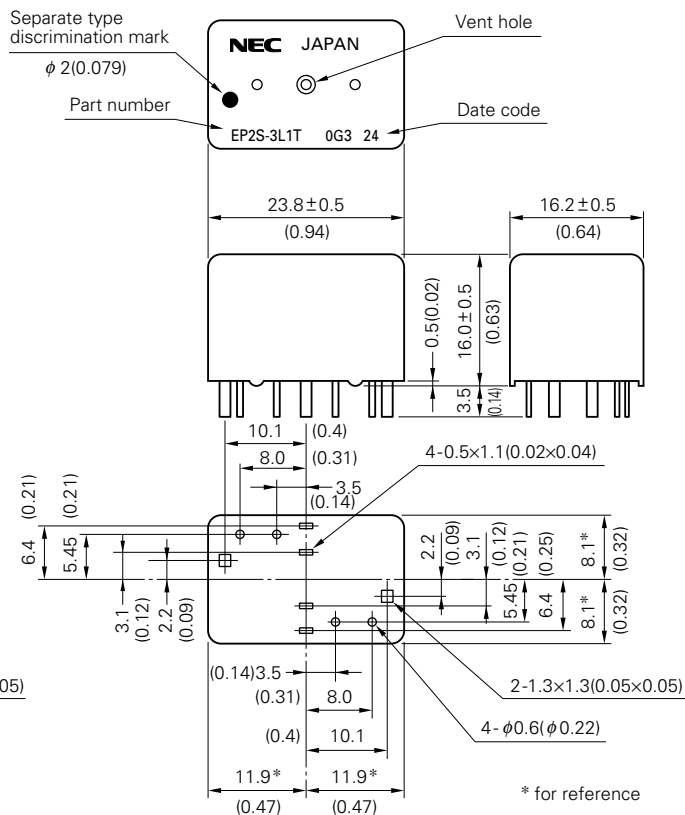
DIMENSIONS mm (inch)

EP2S SERIES

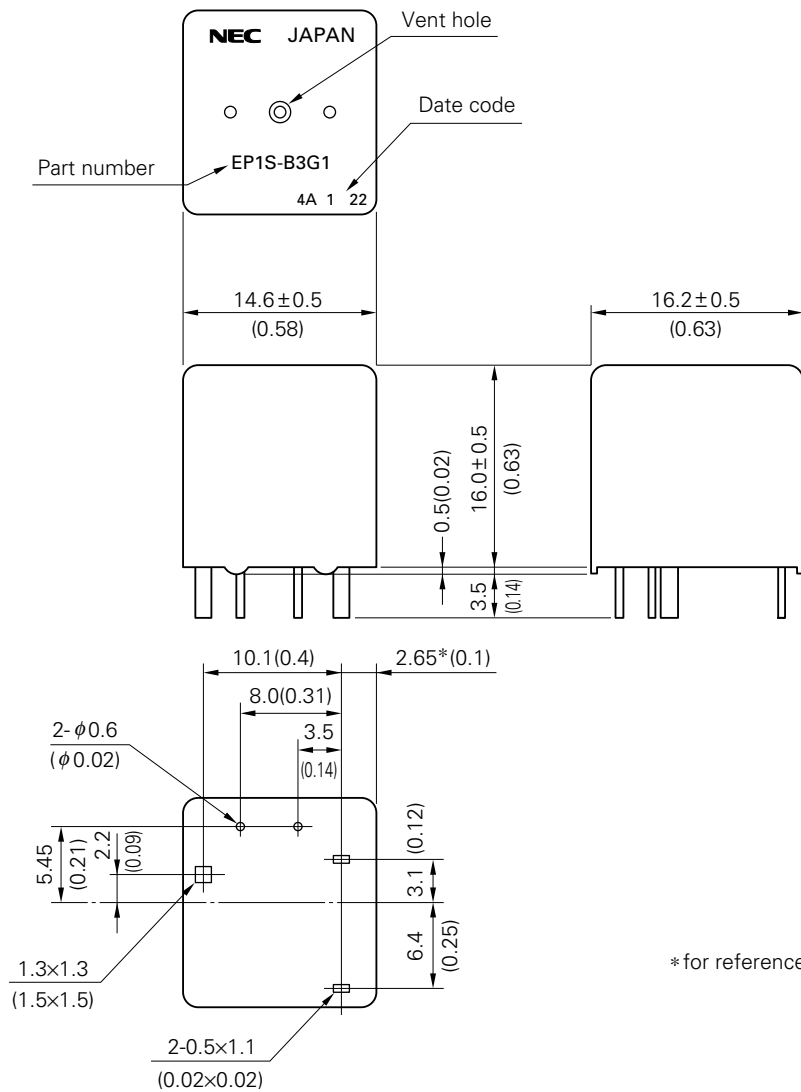
H Bridge Type



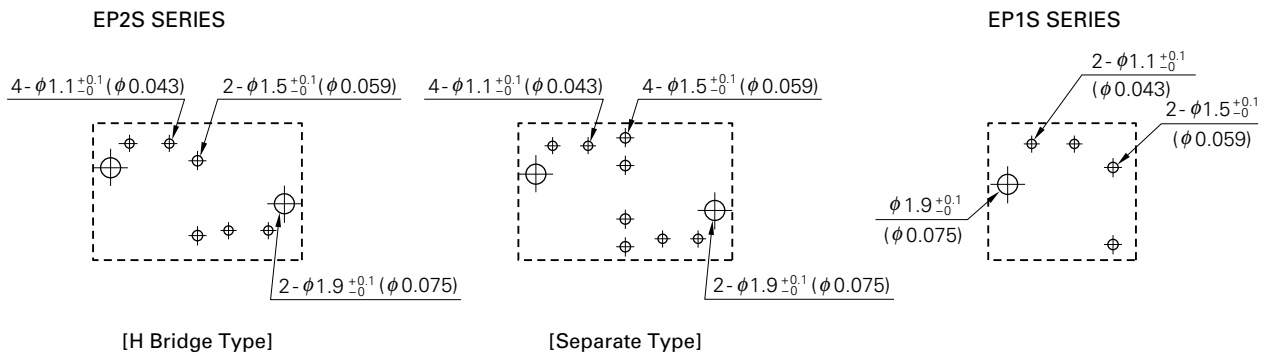
Separate Type



EP1S SERIES



PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)



SPECIFICATIONS

at 25 °C (77 °F)

Items			EP2S	EP1S
Contact Form			1 form C×2 (H bridge type and separate type)	1 form C
Contact Material			Silver oxide complex alloy	
Contact Resistance			50 mΩ max. (measured at 7 A) initial	
Contact Switching Voltage			16 Vdc max.	
Contact Switching Current			25 A max.	
Contact Carrying Current			20 A / regular type (2 minutes max. 12 Vdc at 85°C) 25 A / high carrying current type (2 minutes max. 12 Vdc at 85°C)	25 A / regular type (2 minutes max. 12 Vdc at 85°C) 30 A / high carrying current type (2 minutes max. 12 Vdc at 85°C)
Operate Time			Approx. 5 ms (at 12 Vdc excluding bounce) initial	
Release Time			Approx. 2 ms (at 12 Vdc excluding bounce) initial	
Normal Operate Power			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 / s² [Approx. 10 G] min. (misoperating)	
Vibration Resistance			10 to 300 Hz, 43 m / s² [Approx. 4.4 G] min. (misoperating)	
Ambient Temperature			−40°C to +85°C (−40 °F to +185°F)	
Coil Temperature Rise			50 °C / W (without contact carrying current)	
Life Expectancy	Mechanical		1×10 ⁶ operations	
	Electrical	Contact G	1×10 ⁵ operations (at 14 Vdc, Motor Load 25 A / 7 A)	
		Contact L or N	1×10 ⁵ operations (at 14 Vdc, Motor Load 20 A / 3 A)	
Weight			Approx. 15 gr	Approx. 8 gr

SOUND PRESSURE LEVEL (for reference)

	Sound Pressure level Fast (F) *
Operate (at 12 Vdc drive with diode)	57 dBA nominal
Release (at 12 Vdc drive with diode)	49 dBA nominal

* Refer to the measuring condition in the figure of sound pressure level distribution on page 7.

COIL RATING
EP2S SERIES

at 25 °C (77 °F)

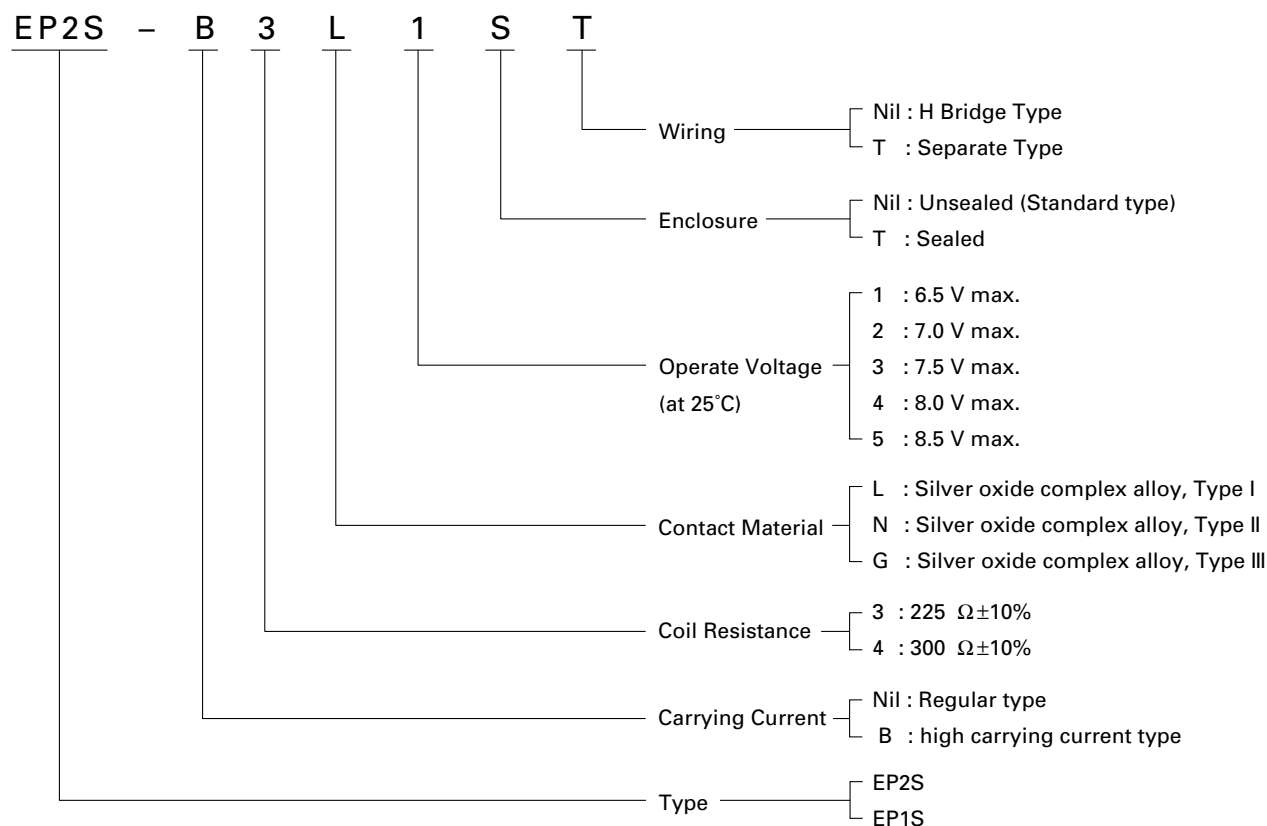
Part Number		Nominal Voltage (Vdc)	Coil Resistance ($\Omega \pm 10\%$)	Must Operate Voltage (Vdc max.)	Must Release Voltage (Vdc min.)	Nominal Operate Power (W)
H Bridge Type	Separate Type					
EP2S-3L1	EP2S-3L1T	12	225	6.5	0.9	0.64
EP2S-3L2	EP2S-3L2T	12	225	7.0	0.9	0.64
EP2S-3L3	EP2S-3L3T	12	225	7.5	0.9	0.64
EP2S-4L3	EP2S-4L3T	12	300	7.5	0.9	0.48
EP2S-4L4	EP2S-4L4T	12	300	8.0	0.9	0.48
EP2S-4L5	EP2S-4L5T	12	300	8.5	0.9	0.48

* High carrying current type available

EP1S SERIES

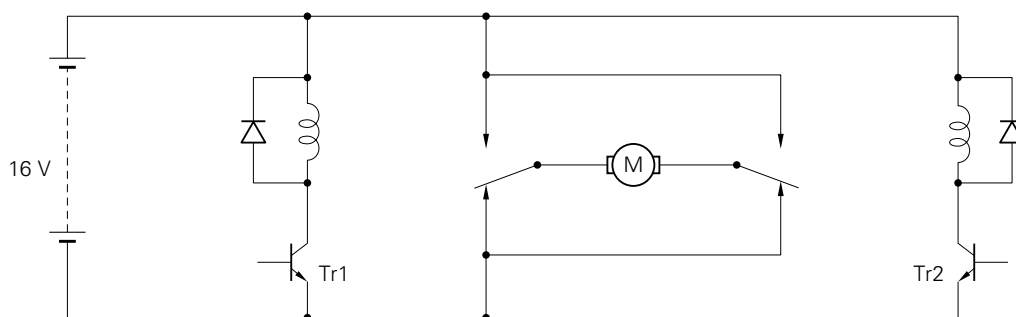
Part Number		Nominal Voltage (Vdc)	Coil Resistance ($\Omega \pm 10\%$)	Must Operate Voltage (Vdc max.)	Must Release Voltage (Vdc min.)	Nominal Operate Power (W)
Regular Type	High Carrying Current Type					
EP1S-3L1	EP1S-B3G1	12	225	6.5	0.9	0.64
EP1S-3L2	EP1S-B3G2	12	225	7.0	0.9	0.64
EP1S-3L3	EP1S-B3G3	12	225	7.5	0.9	0.64
EP1S-4L3	EP1S-B4G3	12	300	7.5	0.9	0.48
EP1S-4L4	EP1S-B4G4	12	300	8.0	0.9	0.48
EP1S-4L5	EP1S-B4G5	12	300	8.5	0.9	0.48

NUMBERING SYSTEM

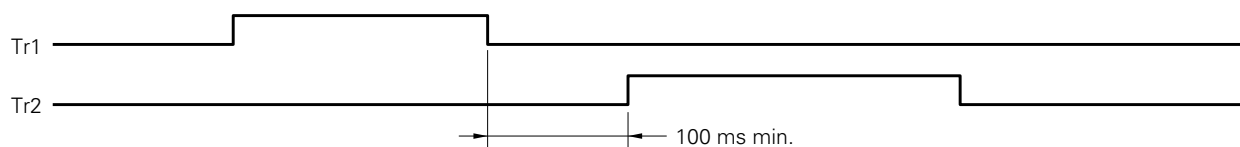


TYPICAL APPLICATION (H Bridge Type)

MOTOR



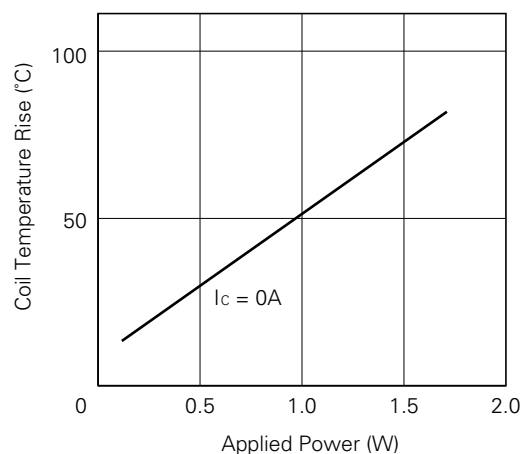
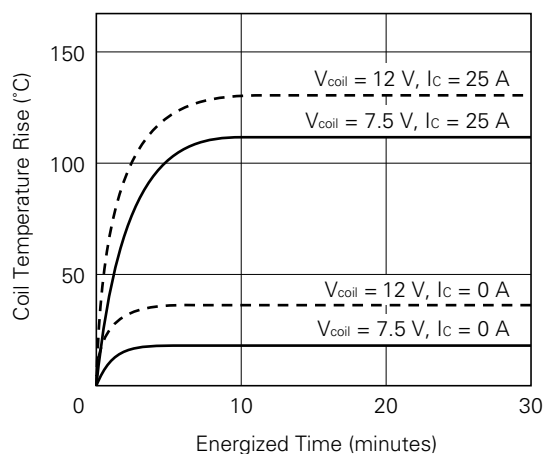
	Tr1	Tr2
STOP	off	off
FORWARD	on	off
REVERSE	off	on



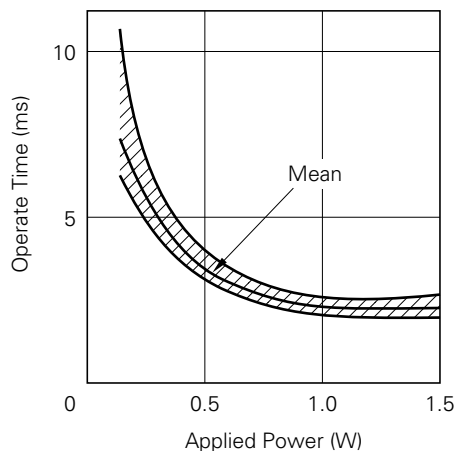
It is necessary to take more than 100 msec intervals for on / off timing between driving Tr1 and Tr2. If the interval is less than 100 msec, an excessive current happen to flow to the relay contacts.

TECHNICAL DATA

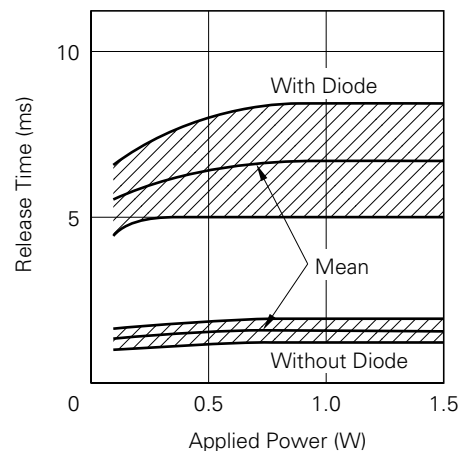
Coil Temperature (EP2S-3L1)



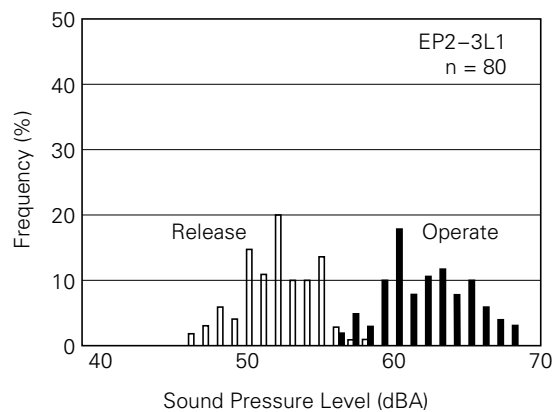
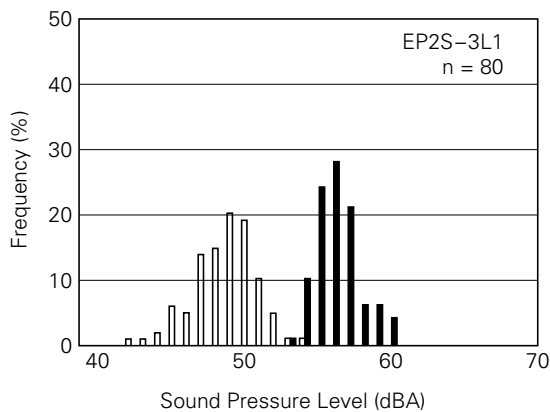
Operate Time (EP2S-3L1)



Release time (EP2S-3L1)



Distribution of Sound Pressure Level (for reference)



Measuring Condition

Measuring Equipment : Precision Sound Meter
 Detector-indicator Characteristic : Fast (F) specified in IEC 651
 Relay Drive : 12 Vdc (Diode clamped)
 Distance between Microphone and Sample : 50 mm
 Background Noise : less than 35 dB (A)
 (A) : Frequency Weighting Characteristic specified in IEC 651

No part of this document may be copied in any form or by any means without the prior written consent of NEC Corporation.

NEC 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 Corporation or others.
