

**COMPACT AND LIGHTWEIGHT****DESCRIPTION**

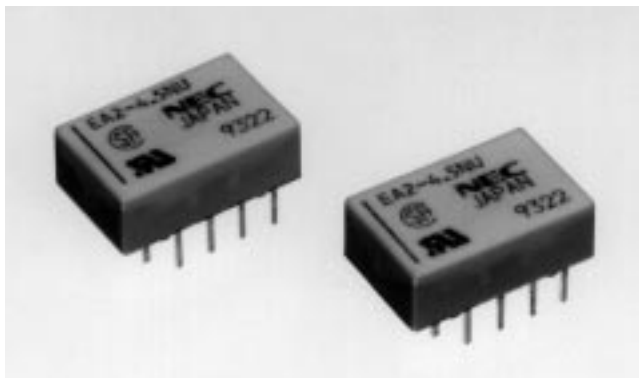
The EA2 series has reduced package size and power consumption to other NEC Conventional relays. Furthermore, it complies with 1500 V surge-voltage requirement of FCC part 68 by the unique structure and the efficient magnetic circuit

**FEATURES**

- Low power consumption
- Compact and light weight
- 2 form c contact arrangement
- Low magnetic arrangement
- Breakdown voltage : 1000 Vac (surge voltage 1500 V), FCC Part 68 compliant
- Tube packaging
- UL recognized (E73266), CAS certified (LR46266)

**APPLICATIONS**

Electronic switching systems, PBX, key telephone systems, automatic test equipment and other electronic equipment.

**ATTENTION****DO NOT EXCEED MAXIMUM RATINGS.**

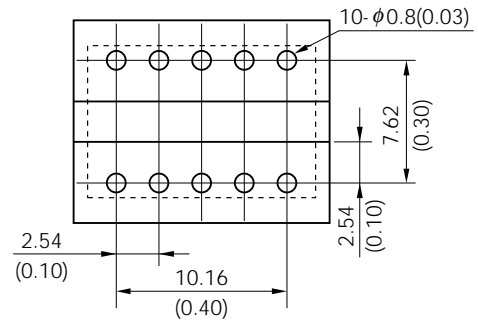
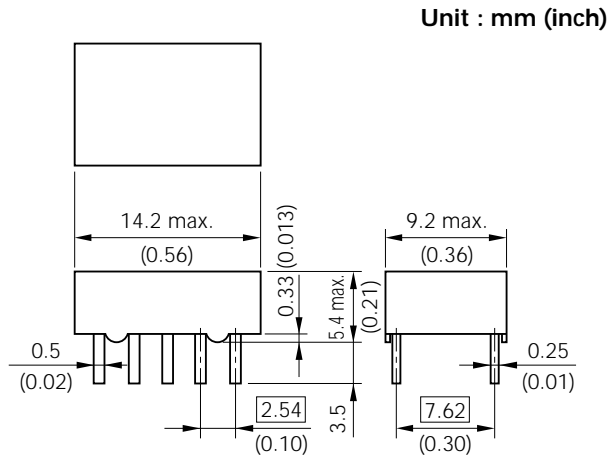
Do not use relays under exceeding conditions such as over ambient temperature, over voltage and over current. Incorrect use could result in abnormal heating, damage to related parts or cause burning.

**READ CAUTIONS IN THE SELECTION GUIDE.**

Read the cautions described in NEC's "Miniature Relays" (ER0046EJ\*) when you choose relays for your application.

OUTLINE DRAWING AND DIMENSIONS

PAD LAYOUT (bottom view)

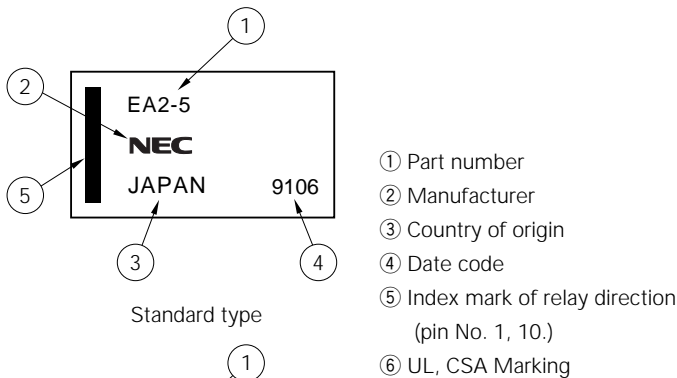


Note. Tolerance  $\pm 0.1$  ( $\pm 0.004$ ) unless otherwise specified

Note. tolerance  $\pm 0.2$  ( $\pm 0.008$ ) unless otherwise specified  
 Dimensions in    show basic size.  
 NJ type : Cover height-6.3 mm (0.248), Leads-2.8 mm (0.11)

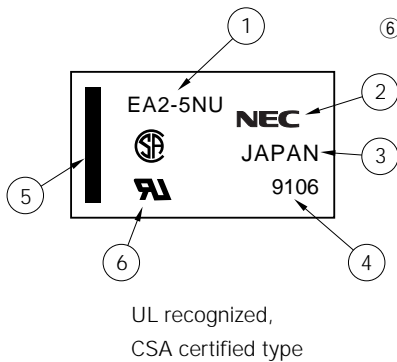
MARKINGS

SAFETY STANDARD AND RATING

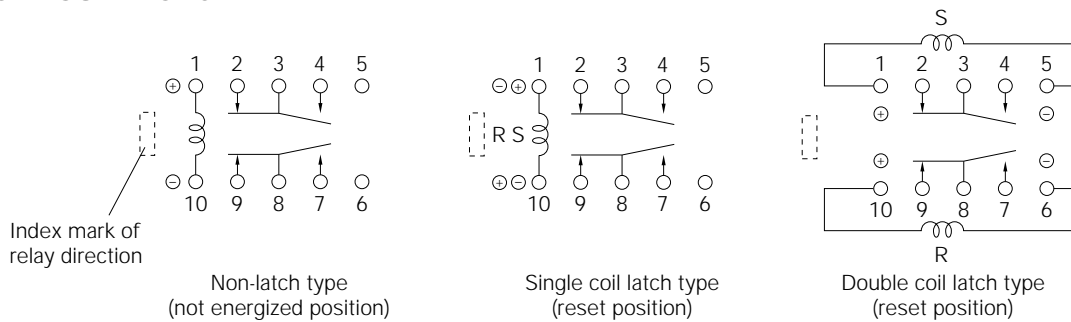


|   |  |
|---|--|
| UL Recognized<br>(UL508)*<br>File No E73266 | CSA Certificated<br>(CSA C22.2 No 14)<br>File No LR46266 |
| 30 Vdc, 1 A (Resistive)                     |  |
| 110 Vdc, 0.3 A (Resistive)                  |  |
| 125 Vdc, 0.5 A (Resistive)                  |  |

\* Spacing : UL114, UL478



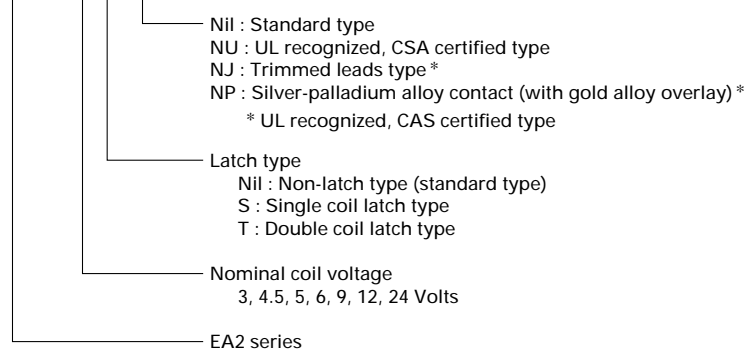
PIN CONFIGURATIONS



S : Coil polarity of set (operate)  
 R : Coil polarity of reset (release)

PART NUMBER SYSTEM

EA2 - 3 S NU



PERFORMANCE CHARACTERISTICS

|                                 |   |  |                     |
|---------------------------------|---|--|---------------------|
| Contact Form                    |   | 2 form c   |                     |
| Contact rating                  | Maximum switching power                   | 30 W (resistive)   | 62.5 VA (resistive) |
|                                 | Maximum switching voltage                 | 220 Vdc  | 250 Vac             |
|                                 | Maximum switching current                 | 1 A  |                     |
|                                 | Maximum carrying current                  | 2 A  |                     |
|                                 | Minimum contact ratings                   | 10 mVdc, 10 $\mu$ A *1   |                     |
| Initial contact resistance      |   | 50 m $\Omega$ typ. (Initial)   |                     |
| Contact material                |   | Silver alloy with gold alloy overlay   |                     |
| Nominal operating Power         | Non-latch type and double coil latch type | 140 mW (3 to 12 V)<br>200 mW (24 V)  |                     |
|                                 | Single coil Latch type                    | 100 mW (3 to 12 V)<br>150 mW (24 V)  |                     |
| Minimum operating Power         | Non-latch type and double coil latch type | 79 mW (3 to 12 V)<br>113 mW (24 V)   |                     |
|                                 | Single coil latch type                    | 56 mW (3 to 12 V)<br>85 mW (24 V)  |                     |
| Operate time (excluding bounce) |   | Approximately 2 ms without diode   |                     |
| Release time (excluding bounce) |   | Approximately 1 ms without diode   |                     |
| Insulation resistance           |   | 1000 M $\Omega$ at 500 Vdc   |                     |
| Breakdown voltage               | Between open contacts                     | 1000 Vac (for one minute)  |                     |
|                                 | Between adjacent contacts                 | 1500 V surge (10 $\times$ 160 $\mu$ s *2)  |                     |
|                                 | Between coil and contact                  |  |                     |
| Shock resistance                |   | 735 m / s <sup>2</sup> (75 G) (misoperating)<br>980 m / s <sup>2</sup> (100 G) (destructive failure)                                   |                     |
| Vibration resistance            |   | 10 to 55 Hz at double amplitude of 3 mm (20 G) (misoperating)<br>10 to 55 Hz, at double amplitude of 5 mm (30 G) (destructive failure) |                     |
| Ambient temperature             |   | -40°C to 85°C  |                     |
| Coil temperature rise           |   | 18 degrees at nominal coil voltage   |                     |
| Running specifications          | No load                                   | 1 $\times$ 10 <sup>8</sup> operations (Non-latch type) *3  |                     |
|                                 |   | 1 $\times$ 10 <sup>7</sup> operations (latch type)   |                     |
|                                 | Load                                      | 50 Vdc 0.1 A (resistive), 1 $\times$ 10 <sup>6</sup> operations at 85°C, 2 Hz  |                     |
|                                 |   | 10 Vdc 10 mA (resistive), 1 $\times$ 10 <sup>6</sup> operations at 85°C, 2 Hz  |                     |
| Weight                          |   | Approximately 1.5 grams  |                     |

\*1 This value is a reference value in the resistance load.

Minimum capacity changes depending on switching frequency and environment temperature and the load.

\*2 Rise time : 10  $\mu$ s, fall time : 160  $\mu$ s

\*3 This shows a number of operation where it can be running by which a fatal defect is not caused, and a number of operation by which a steady characteristic is maintained is 1  $\times$  10<sup>7</sup> times.

PRODUCT LINEUP

Non-latch Type

at 20°C

| Nominal Coil Voltage (Vdc) | Coil Resistance ( $\Omega$ ) $\pm 10\%$ | Must Operate Voltage (Vdc) | Must Release Voltage (Vdc) |
|----------------------------|---|----------------------------|----------------------------|
| 3                          | 64.3                                    | 2.25                       | 0.3                        |
| 4.5                        | 145                                     | 3.38                       | 0.45                       |
| 5                          | 178                                     | 3.75                       | 0.5                        |
| 6                          | 257                                     | 4.5                        | 0.6                        |
| 9                          | 579                                     | 6.75                       | 0.9                        |
| 12                         | 1028                                    | 9                          | 1.2                        |
| 24                         | 2880                                    | 18                         | 2.4                        |

Single-Coil Latch Type

at 20°C

| Nominal Coil Voltage (Vdc) | Coil Resistance ( $\Omega$ ) $\pm 10\%$ | Must Operate Voltage (Vdc) | Must Release Voltage (Vdc) |
|----------------------------|---|----------------------------|----------------------------|
| 3                          | 90                                      | 2.25                       | 2.25                       |
| 4.5                        | 202.5                                   | 3.38                       | 3.38                       |
| 5                          | 250                                     | 3.75                       | 3.75                       |
| 6                          | 360                                     | 4.5                        | 4.5                        |
| 9                          | 810                                     | 6.75                       | 6.75                       |
| 12                         | 1440                                    | 9                          | 9                          |
| 24                         | 3840                                    | 18                         | 18                         |

Double-Coil Latch Type \*\* (Can not be driven by reverse polarity for reverse operation.)

at 20°C

| Nominal Coil Voltage (Vdc) |   | Coil Resistance ( $\Omega$ ) $\pm 10\%$ | Must Operate Voltage (Vdc) | Must Release Voltage (Vdc) |
|----------------------------|---|---|----------------------------|----------------------------|
| 3                          | S | 64.3                                    | 2.25                       | -                          |
|                            | R | 64.3                                    | -                          | 2.25                       |
| 4.5                        | S | 145                                     | 3.38                       | -                          |
|                            | R | 145                                     | -                          | 3.38                       |
| 5                          | S | 178                                     | 3.75                       | -                          |
|                            | R | 178                                     | -                          | 3.75                       |
| 6                          | S | 257                                     | 4.5                        | -                          |
|                            | R | 257                                     | -                          | 4.5                        |
| 9                          | S | 579                                     | 6.75                       | -                          |
|                            | R | 579                                     | -                          | 6.75                       |
| 12                         | S | 1028                                    | 9                          | -                          |
|                            | R | 1028                                    | -                          | 9                          |
| 24                         | S | 2880                                    | 18                         | -                          |
|                            | R | 2880                                    | -                          | 18                         |

Note \* Test by pulse voltage

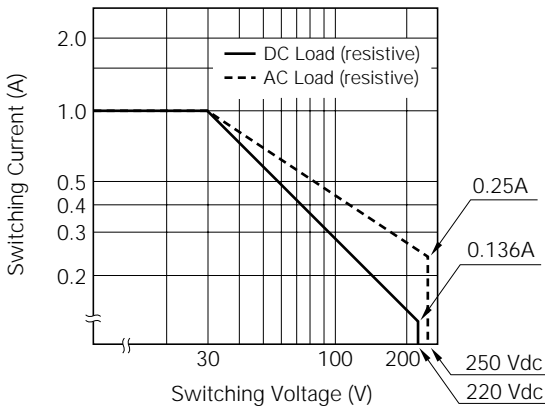
\*\* S : Set coil (pin No.1...⊕, pin No.5...⊖) R: Reset coil (pin No.10...⊕, pin No.6...⊖)

The latch type relays should be initialized at appointed position before using, and should be energized to specific polarity by a bone polarity to avoid wrong operation.

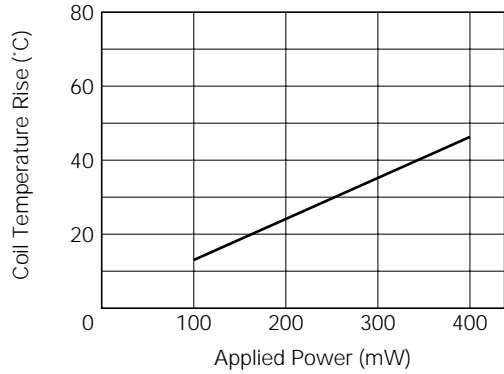
Any special coil requirement, please contact NEC for availability.

TYPICAL PERFORMANCE DATA

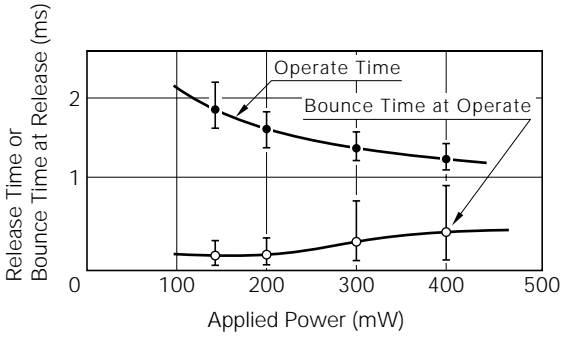
SWITCHING CAPACITY



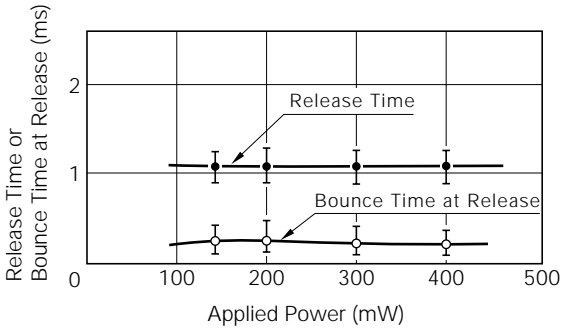
COIL TEMPERATURE RISE



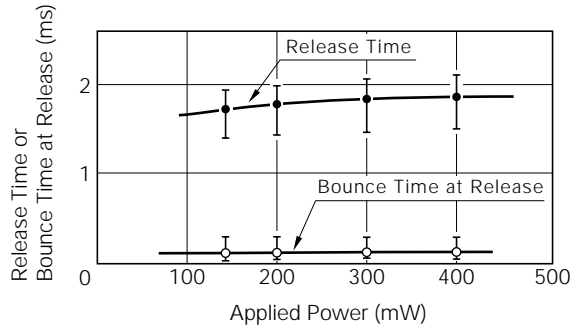
OPERATE TIME



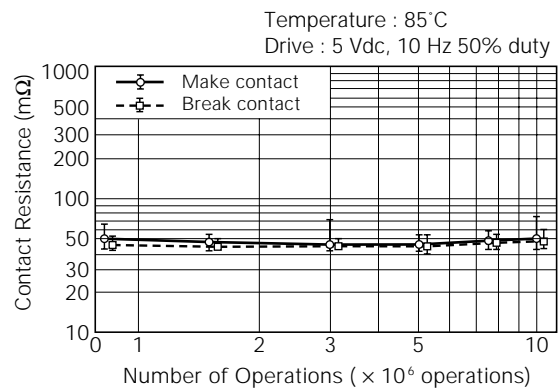
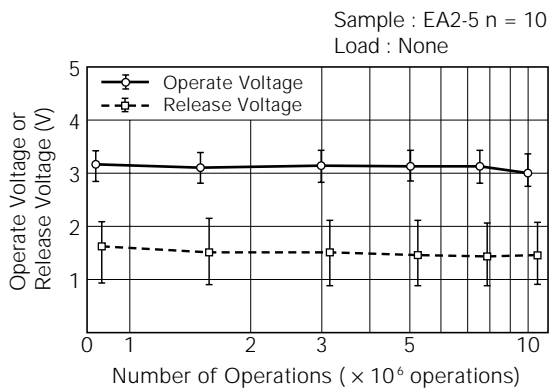
RELEASE TIME WITHOUT DIODE



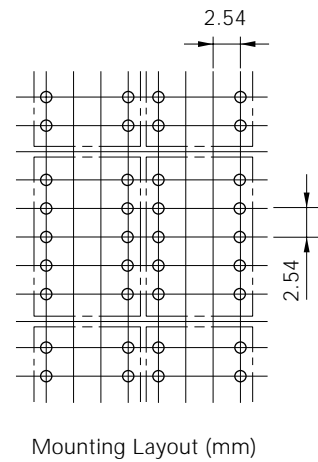
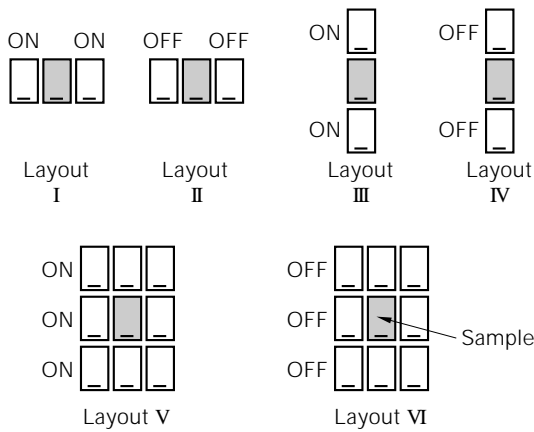
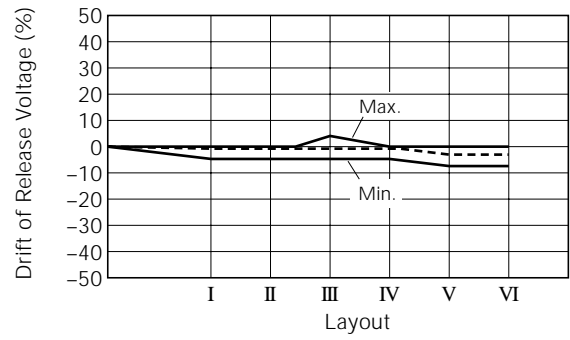
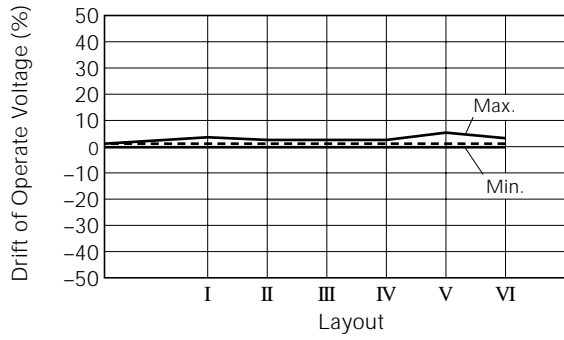
RELEASE TIME WITH DIODE



RUNNING SPECIFICATIONS (No load)

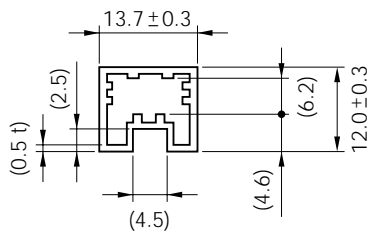


MAGNETIC INTERFERENCE

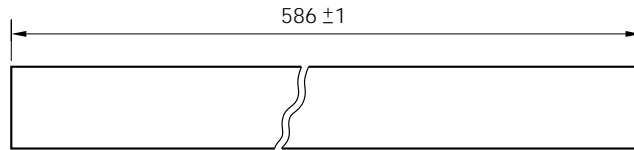


PACKAGE

Dimensions of Relay Tube (Unit : mm)

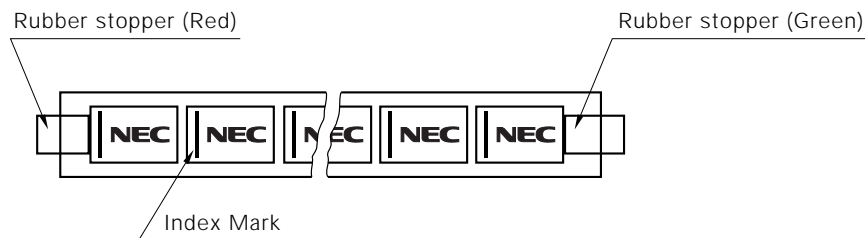


40 pieces / Tube  
Material : Polyvinyl chloride  
(anti-static treated)



( ) Reference

Outline of Package



## GUIDE TO APPLICATIONS

1. When connecting coils, refer to the pin configuration to prevent misoperation or malfunction.
2. The latch type relay should be initialized at the appointed position (set or reset position) when using, and should be energized or deenergized to the specified polarity to avoid wrong operations by reversed contact state.
3. Soldering should be done at 250°C within 10 sec.
4. Ultrasonic cleaning is not recommended to keep reliable contact performance. Alcohol-based solvents are available as proper solvents.
5. Pressurized stress on the relay cover is not favorable to keep reliable operation of the relay during operation.
6. Minimum contact load of the relay is 10 mV, 10  $\mu$ A.  
This value is a reference value in the resistance load.  
Minimum capacity changes depending on switching frequency and environment temperature and the load.

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NEC devices are classified into the following three quality grades:

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

Anti-radioactive design is not implemented in this product.