

## FEATURES

- Flat VSWR characteristic to the temperature change.
- Linear attenuation characteristic to temperature fluctuation.
- RoHS compliant.

## APPLICATIONS

- Temperature compensation of microwave high power amplifier.

## SPECIFICATIONS

### Electrical characteristics

|                             | E-TA3216                                                                                    | E-TA2012                                                                                                                                      |
|-----------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Attenuation                 | 1, 2, 3, 4, 5 dB<br>at 25 °C                                                                | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 dB<br>at 25 °C                                                                                                  |
| Tolerance                   | DC ~ 3 GHz : +0.5 dB, DC ~ 1 GHz : -0.5 dB<br>1 ~ 3 GHz : -1.0dB (at 25 °C, 50 Ω load)      | ± 0.5 dB<br>(at 25 °C, 50 Ω load)                                                                                                             |
| Impedance                   | 50 Ω                                                                                        |                                                                                                                                               |
| VSWR                        | DC ~ 2 GHz : Less than 1.3<br>2 ~ 3 GHz : Less than 1.7<br>(at 25 °C)                       | Less than 1.3<br>(at 25 °C)                                                                                                                   |
| Temperature Coefficient     | N5 ~ N8 at 1 GHz :<br>Please refer to the chart of "Example of Attenuation vs. Temperature" | N1 ~ N8 at 1 GHz :<br>Please refer to the chart of "Example of Attenuation vs. Temperature"<br>N1 is manufactured upon receipt of order basis |
| Frequency Range             | DC ~ 3 GHz                                                                                  |                                                                                                                                               |
| Power Rating                | 100 mW                                                                                      | 63 mW                                                                                                                                         |
| Operating Temperature Range | - 40 °C ~ +100 °C                                                                           |                                                                                                                                               |

### Temperature Characteristics

| TCA : Temperature Coefficient of Attenuation N1 ~ N8 (dB/dB/°C) |               |               |
|-----------------------------------------------------------------|---------------|---------------|
| N1 ; - 0.0119                                                   | N4 ; - 0.0047 | N7 ; - 0.0026 |
| N2 ; - 0.0088                                                   | N5 ; - 0.0041 | N8 ; - 0.0019 |
| N3 ; - 0.0062                                                   | N6 ; - 0.0035 |               |

Note. Temperature coefficient of E-TA3216 is N5 ~ N8 and E-TA2012 is N1 ~ N8.

## PART NUMBER DESIGNATION

**E-TA2012 T 1 dB N8**

Series name and size

E-TA3216, E-TA2012

Form of packaging

T : Taping (1000 pcs/reel)

Blank : Bulk (100 pcs/in plastic bags)

Temperature Coefficient of Attenuation

(N1, N2, N3, N4, N5, N6, N7, N8)

Attenuation [dB]

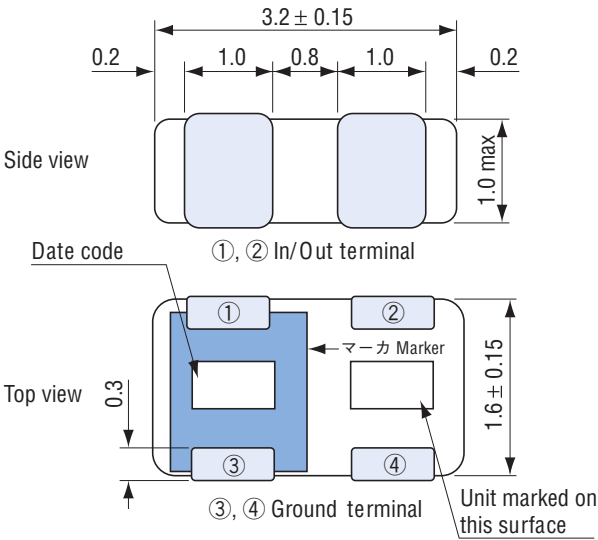
(1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

E-TA

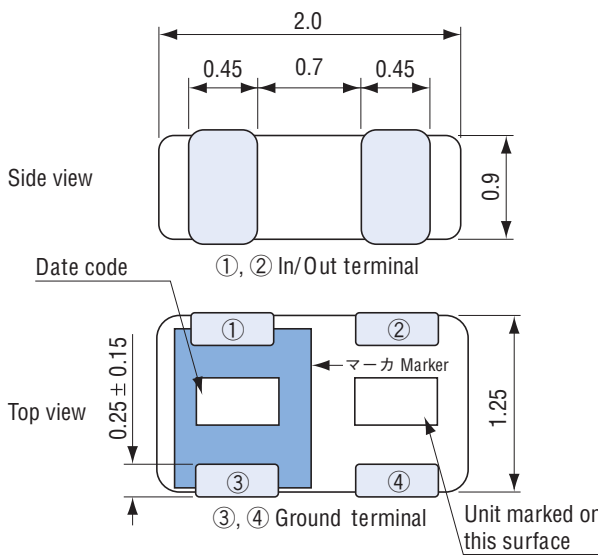
THERMAL VARIABLE ATTENUATORS

■
 OUTLINE DIMENSIONS

●
 E-TA3216
 Unless otherwise specified, tolerance :  $\pm 0.2$  (Unit : mm)



●
 E-TA2012
 Unless otherwise specified, tolerance :  $\pm 0.2$  (Unit : mm)

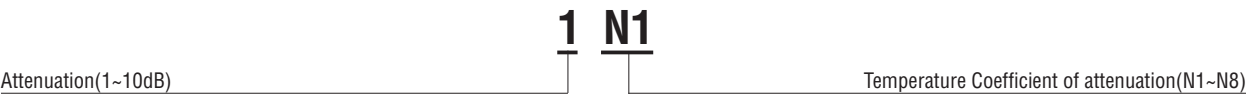


<
 Marking
 >

●
 Date code (2 digits)



●
 Model code (3 digits)



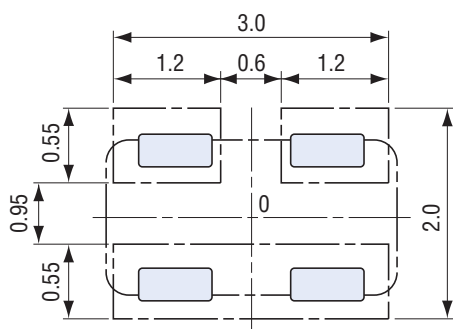
# E-TA

## THERMAL VARIABLE ATTENUATORS

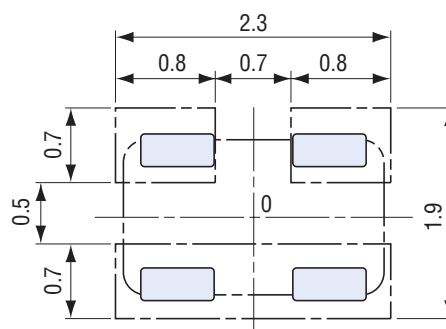
### RECOMMENDED PAD OUTLINE DIMENSIONS

Unless otherwise specified, tolerance :  $\pm 0.3$  (Unit : mm)

#### ● E-TA3216



#### ● E-TA2012

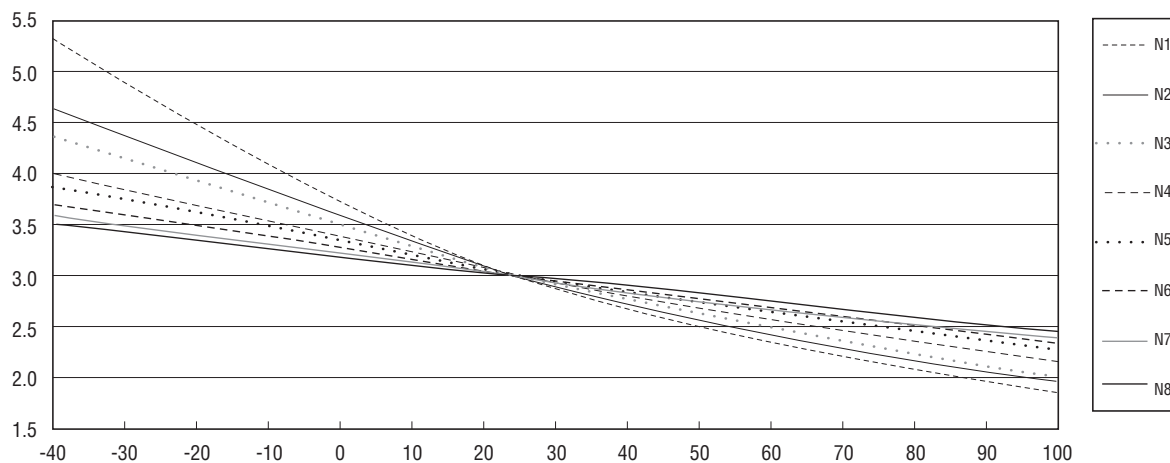


Note) The zero point is center of mounting

### EXAMPLE OF ATTENUATION VS. TEMPERATURE : 3 dB

#### ● E-TA2012 3dB N\*

#### 3 dB Attenuation vs. Temperature



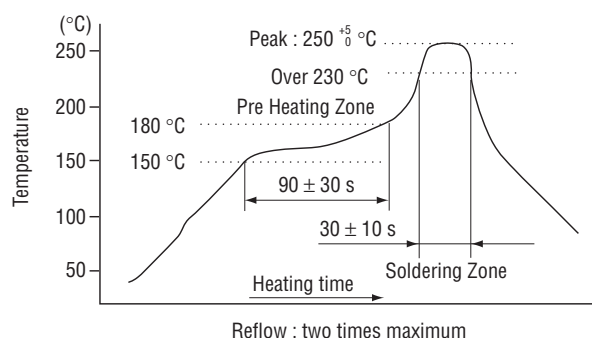
# E-TA

## THERMAL VARIABLE ATTENUATORS

### ENVIRONMENTAL CHARACTERISTICS

| Test item                     | Test conditions                                                                                                                            | Specifications                                                 |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| A short time overload voltage | Apply the rated voltage of 2.5 times for 5 sec.                                                                                            | Attenuation $\pm 0.1$ dB                                       |
| Load life                     | 70 $\pm$ 3 °C, Apply rated voltage for 90 minutes followed by 30 minutes Intermission. This cycle is repeated for 1000 hours.              | Attenuation $\pm 0.2$ dB                                       |
|                               | 60 $\pm$ 2 °C, 90 ~ 95 %RH, Apply rated voltage for 90 minutes followed by 30 minutes Intermission. This cycle is repeated for 1000 hours. | Attenuation $\pm 0.2$ dB                                       |
| Thermal shock                 | - 40 °C ~ 100 °C (0.5 h), 5 cycles                                                                                                         | Attenuation $\pm 0.1$ dB                                       |
| Vibration                     | (Vibration) 10 ~ 55 Hz、(Amplitude) 1.5 mm、<br>10-55-10 Hz/minutes、xyz 2h each                                                              | Attenuation $\pm 0.1$ dB                                       |
| Soldering heat                | Peak temperature 255 °C, two times maximum                                                                                                 | Attenuation $\pm 0.1$ dB                                       |
| Solderability                 | 245 $\pm$ 5 °C (lead free), 3 $\pm$ 0.5 s                                                                                                  | 95 % or more of the immersed area should be adequately wetted. |

### REFLOW PROFILE FOR SOLDERING HEAT EVALUATION



### PACKAGING SPECIFICATIONS

#### ● Taping packaging specifications

- Taping will be accepted for units of 1000 pcs. per reel. Orders will be accepted for units of 1000 pcs. i.e., 1000, 2000, pcs., etc.
- Taping version is boxed with one reel (1000 pcs.). Maximum number of consecutive missing pieces = 2

#### ● Bulk pack specifications

- Unit of bulk in a plastic bag package is 100 pcs. per pack.
- Boxing of bulk in a plastic bag is performed with 200 pcs. per box.

# E-TA

## THERMAL VARIABLE ATTENUATORS

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### ■ CAUTION

#### (1) Construction

The structure of E-TA3216 and E-TA2012 are designed to withstand flux and cleaning solvents used in the soldering and cleaning process. This sealed structure is also effective for dust and moisture as well, but its capability is not limitless due to inside moving parts.

For the both products, the following conditions are not recommended.

- ① Environmental air with sulphide gas, corrosive gas or reducing gas
- ② Rapid cooling of solvents
- ③ Long time damping into solvents (especially at high temperature)
- ④ Environmental air with high humidity

#### (2) Notes for storage

Careful attention must be paid when the components are stored.

Environmental temperature, humidity, etc. might affect the solder ability of the terminals and the function of the package. Listed below are notes to be observed.

- ① Under extremely high temperature and humid conditions, the quality decay of the package materials will be accelerated.
- ② It is recommended to store the components in the room at the temperature below 25 °C and the relative humidity below 75 %.
- ③ The environmental air must be free from corrosive gas such as sulphide gas.
- ④ Exposure to the direct sunlight and dust must be avoided.
- ⑤ Handle carefully to avoid deformation of terminals.
- ⑥ Please use the products within one year from the delivery.
- ⑦ Please do not open the smallest unit of package before use.

**Note1. Specifications are subject to change without notice.  
Specifications in this catalog are reference.**