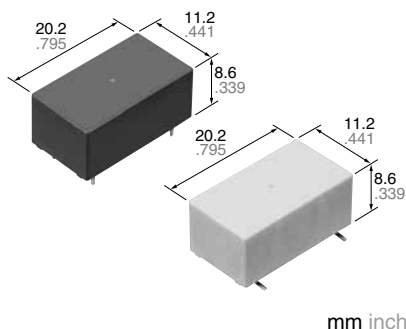


**2.6 GHz capable, 10 W  
carrying power (at 2.6 GHz),  
50Ω/75Ω impedance and  
1 Form C relays**

## RE RELAYS (ARE)



mm inch

**RoHS compliant**

### FEATURES

- Excellent high frequency characteristics (to 2.6GHz)
- Surface-mount type also available
- Compact and slim size  
Size: 20.2(L) × 11.2(W) × 8.9(H)\* mm  
.795(L) × .441(W) × .350(H) inch  
\*The height of Surface-mount type is 9.6 mm .378 inch size.

### TYPICAL APPLICATIONS

1. Broadcasting and video markets.
  - Digital broadcasting equipment
  - STB/tuner
2. Communications market
  - Antennae switching
  - All types of wireless devices

If you consider using applications with low level loads or with high frequency switching, please consult us.

Protective construction: Sealed type

### ORDERING INFORMATION

	ARE	1					
RE relays							
Contact arrangement							
1: 1 Form C							
Operating function							
0: Single side stable type (Impedance 50Ω)							
3: Single side stable type (Impedance 75Ω)							
Terminal shape							
Nil: Standard PC board terminal							
A: Surface-mount terminal							
Coil voltage (DC)							
03: 3V, 4H: 4.5V, 06: 6V, 09: 9V, 12: 12V, 24: 24V (H=0.5)							
Packing style							
Nil: Carton packing (Standard PC board terminal only)							
Tube packing (Surface-mount terminal only)							
Z: Tape and reel packing (picked from 14 pin side) (Surface-mount terminal only)							

TYPES

1. Standard PC board terminal

Rated voltage	Part No.		Standard packing	
	Single side stable type (Impedance 50Ω)	Single side stable type (Impedance 75Ω)	Carton	Case
3 V DC	ARE1003	ARE1303	50 pcs.	500 pcs.
4.5 V DC	ARE104H	ARE134H		
6 V DC	ARE1006	ARE1306		
9 V DC	ARE1009	ARE1309		
12 V DC	ARE1012	ARE1312		
24 V DC	ARE1024	ARE1324		

2. Surface-mount terminal

1) Tube package

Rated voltage	Part No.		Standard packing	
	Single side stable type (Impedance 50Ω)	Single side stable type (Impedance 75Ω)	Tube	Case
3 V DC	ARE10A03	ARE13A03	25 pcs.	200 pcs.
4.5 V DC	ARE10A4H	ARE13A4H		
6 V DC	ARE10A06	ARE13A06		
9 V DC	ARE10A09	ARE13A09		
12 V DC	ARE10A12	ARE13A12		
24 V DC	ARE10A24	ARE13A24		

2) Tape and reel package

Rated voltage	Part No.		Standard packing	
	Single side stable type (Impedance 50Ω)	Single side stable type (Impedance 75Ω)	Tape and reel	Case
3 V DC	ARE10A03Z	ARE13A03Z	400 pcs.	800 pcs.
4.5 V DC	ARE10A4HZ	ARE13A4HZ		
6 V DC	ARE10A06Z	ARE13A06Z		
9 V DC	ARE10A09Z	ARE13A09Z		
12 V DC	ARE10A12Z	ARE13A12Z		
24 V DC	ARE10A24Z	ARE13A24Z		

RATING

1. Coil data

Rated voltage	Pick-up voltage* (at 20°C 68°F)	Drop-out voltage* (at 20°C 68°F)	Rated operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Rated operating power	Max. allowable voltage
3 V DC	75%V or less of rated voltage (Initial)	10%V or more of rated voltage (Initial)	66.7 mA	45 Ω	200 mW	110%V (at 60°C 140°F) 150%V (at 20°C 68°F) of rated voltage
4.5 V DC			44.4 mA	101 Ω		
6 V DC			33.3 mA	180 Ω		
9 V DC			22.2 mA	405 Ω		
12 V DC			16.7 mA	720 Ω		
24 V DC			8.3 mA	2,880 Ω		

\* Square, pulse drive (JIS C5442)

## 2. Specifications

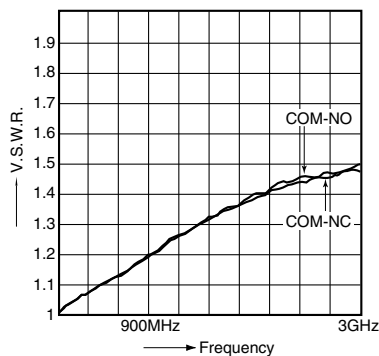
Characteristics	Item	Specifications
Contact data	Arrangement	1 Form C
	Contact resistance (initial)	Max. 100mΩ (By voltage drop 10V AC 10mA)
	Contact material	Gold plating
	Contact rating (resistive)	1W (at 2.6 GHz [Impedance 50Ω, V.S.W.R. Max. 1.7] [Impedance 75Ω, V.S.W.R. Max. 1.5]) 10mA 24V DC
	Contact input power	10W (at 2.6GHz [Impedance 50Ω, V.S.W.R. Max. 1.7] [Impedance 75Ω, V.S.W.R. Max. 1.5])
	Max. switching voltage	30V DC
	Max. switching current	0.5A DC
High frequency characteristics (Initial) (Impedance 50Ω)	V.S.W.R.	Max. 1.3 (to 900MHz), Max. 1.7 (to 2.6GHz)
	Insertion loss	Max. 0.2dB (to 900MHz), Max. 0.7dB (to 2.6GHz)
	Isolation	Min. 60dB (to 900MHz), Min. 30dB (to 2.6GHz)
High frequency characteristics (Initial) (Impedance 75Ω)	V.S.W.R.	Max. 1.2 (to 900MHz), Max. 1.5 (to 2.6GHz)
	Insertion loss	Max. 0.2dB (to 900MHz), Max. 0.5dB (to 2.6GHz)
	Isolation	Min. 60dB (to 900MHz), Min. 30dB (to 2.6GHz)
Insulation resistance (Initial)		Min. 100MΩ (at 500V DC, Measured portion is the same as the case of dielectric voltage.)
Breakdown voltage (Initial)	Between open contacts	500 Vrms for 1min. (detection current: 10mA)
	Between contact and coil	1,000 Vrms for 1min. (detection current: 10mA)
	Between contact and earth terminal	500 Vrms for 1min. (detection current: 10mA)
Time characteristics	Operate time (initial)	Max. 10ms (at 20°C 68°F, at rated voltage, without bounce)
	Release time (initial)	Max. 5ms (at 20°C 68°F, at rated voltage, without bounce, without diode)
Mechanical characteristics	Shock resistance	Functional Min. 500 m/s <sup>2</sup> (half-sine shock pulse: 11ms; detection time: 10μs)
		Destructive Min. 1,000m/s <sup>2</sup> (half-sine shock pulse: 6ms)
	Vibration resistance	Functional 10 to 55 Hz at double amplitude of 3mm (detection time: 10μs)
		Destructive 10 to 55 Hz at double amplitude of 5mm
Expected life	Mechanical	Min. 10 <sup>8</sup> (at 180 times/min.)
	Electrical	Min. 3×10 <sup>5</sup> (1W, 2.6GHz, [Impedance 50Ω, V.S.W.R. ≤ 1.7] [Impedance 75Ω, V.S.W.R. ≤ 1.5]) Min. 3×10 <sup>5</sup> (10mA 24V DC (resistive) (at 20 times/min.))
Conditions	Conditions for operation, transport and storage*	Ambient temperature: -40 to +70°C -40 to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)
Unit weight		Approx. 5 g .18 oz

Note: \* The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to [6] AMBIENT ENVIRONMENT in GENERAL APPLICATION GUIDELINES.

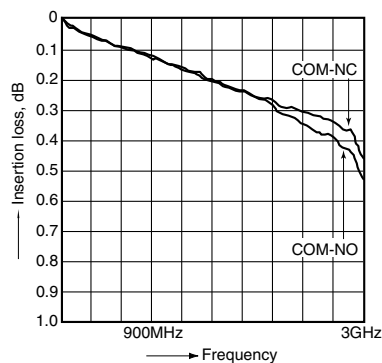
## REFERENCE DATA

### 1-(1). High frequency characteristics (Impedance 50Ω) (Standard PC board terminal)

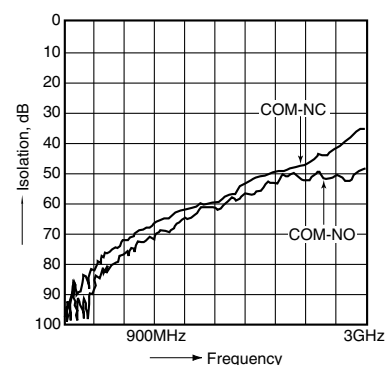
#### • V.S.W.R. characteristics



#### • Insertion loss characteristics

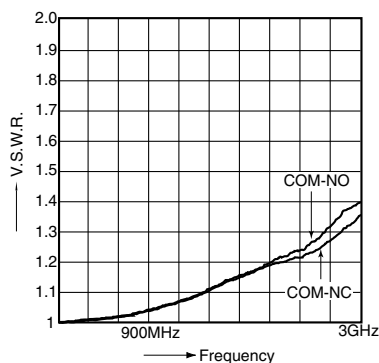


#### • Isolation characteristics

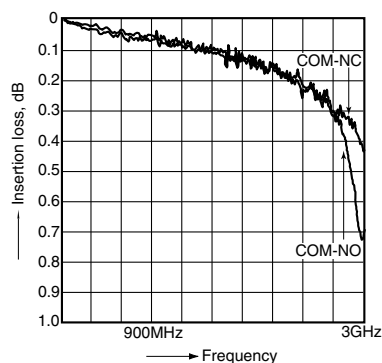


### 1-(2). High frequency characteristics (Impedance 75Ω) (Standard PC board terminal)

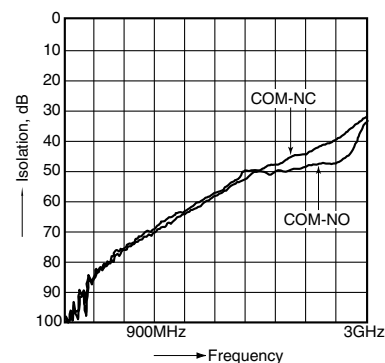
#### • V.S.W.R. characteristics

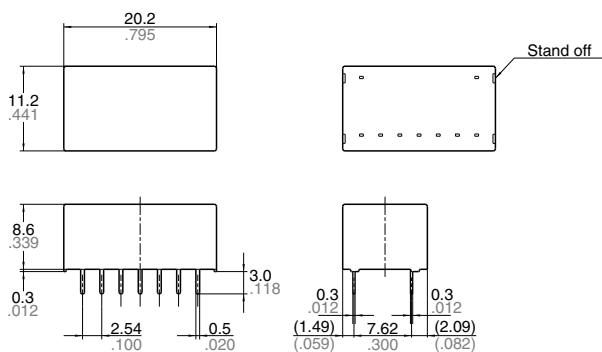
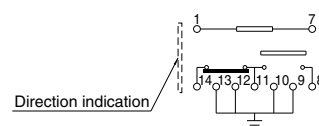


#### • Insertion loss characteristics

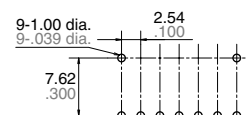
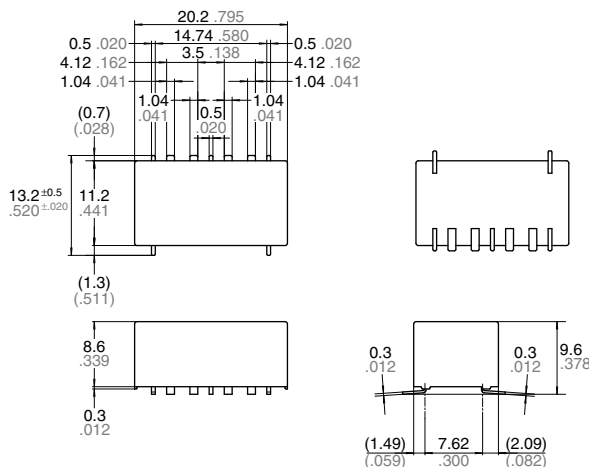


#### • Isolation characteristics

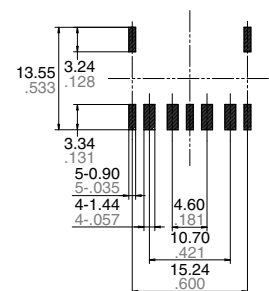
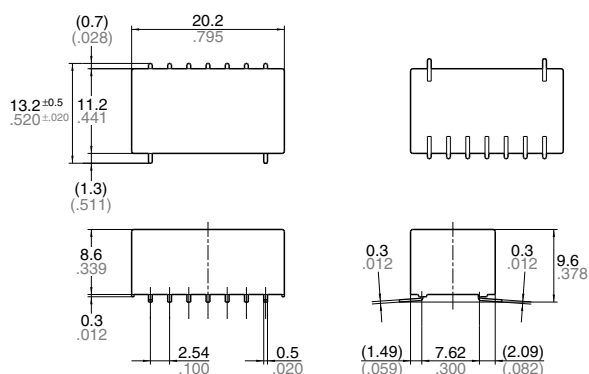
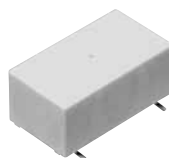
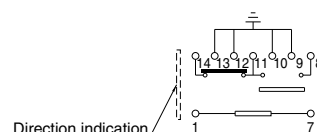


**DIMENSIONS** (mm inch)The CAD data of the products with a **CAD** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>**1. Standard PC board terminal (50Ω, 75Ω type)****CAD**Tolerance:  $\pm 0.3 \pm 0.012$ **Schematic (Bottom view)**

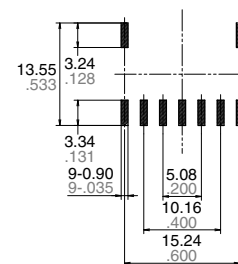
(Deenergized condition)

**PC board pattern**Tolerance:  $\pm 0.1 \pm 0.004$ **2. Surface mount terminal****• 50Ω type****CAD**Tolerance:  $\pm 0.3 \pm 0.012$ **Schematic (Top view)**

(Deenergized condition)

**PC board pattern**Tolerance:  $\pm 0.1 \pm 0.004$ **• 75Ω type****CAD**Tolerance:  $\pm 0.3 \pm 0.012$ **Schematic (Top view)**

(Deenergized condition)

**PC board pattern**Tolerance:  $\pm 0.1 \pm 0.004$

## NOTES

### 1. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%. However, check it with the actual circuit since the characteristics may be slightly different.

## 2. Cleaning

For automatic cleaning, the boiling method is recommended. Avoid ultrasonic cleaning which subjects the relays to high frequency vibrations, which may cause the contacts to stick. It is recommended that alcoholic solvents be used.

### 3. Soldering

(Standard PC board terminal)

1) The manual soldering shall be performed under following condition.

Max. 260°C 500°F 10s

Max. 350°C 662°F 3s

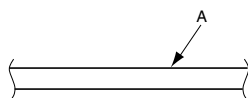
The affect of the PCB on the relay will differ depending on the type of PCB used. Please verify the type of PCB to be used. Preheat according to the following conditions.

Temperature	120°C 248°F or less
Time	Within 2 minute

Soldering should be done at  $260\pm 5^{\circ}\text{C}$   $500\pm 9^{\circ}\text{F}$  within 6 s.

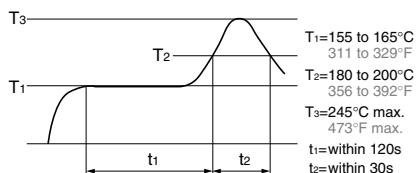
2) In case of automatic soldering, the following conditions should be observed (Surface-mount terminal)

(1) Position of measuring temperature



A: Surface of PC board where relay is mounted.

(2) IR (infrared reflow) soldering method

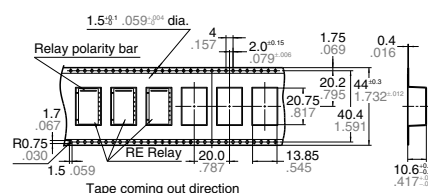


Temperature rise of relay itself may vary according to the mounting level or the heating method of reflow equipment. Therefore, please set the temperature of soldering portion of relay terminal and the top surface of the relay case not to exceed the above mentioned soldering condition.

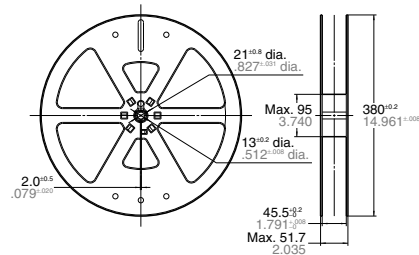
It is recommended to check the temperature rise of each portion under actual mounting condition before use.

#### 4. Packing style

### 1) Tape dimensions



## 2) Dimensions of plastic reel



## 5. Conditions for operation, transport and storage conditions

1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:

(1) Temperature:

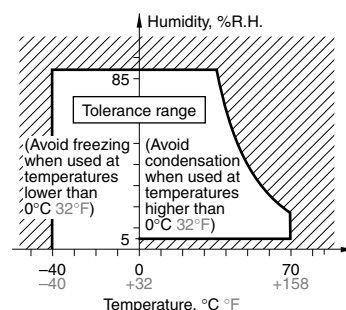
–40 to +70°C –40 to +158°F

(2) Humidity: 5 to 85% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.

(3) Atmospheric pressure: 86 to 106 kPa Temperature and humidity range for usage, transport, and storage:



## 2) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

### 3) Freezing

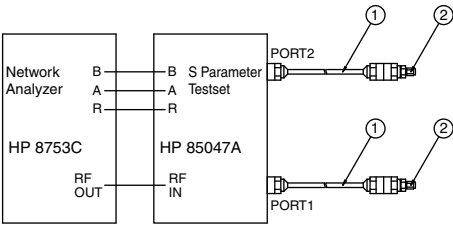
Condensation or other moisture may freeze on the relay when the temperature is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.

4) Low temperature, low humidity environments

The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

6. Measuring method

1) 50Ω type



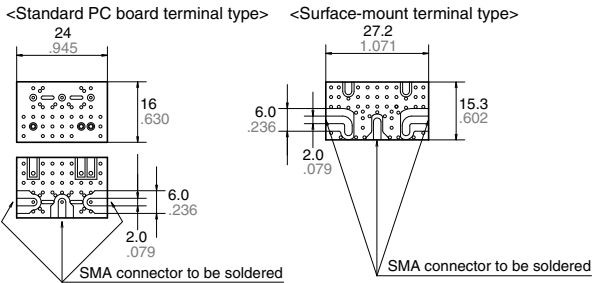
Connect connectors 1 and 2 respectively to PORT1 and PORT2. Perform calibration using the 3.5 mm .138 inch calibration kit (50Ω).

No.	Part number	Description
1	HP 11857D	7mm .276inch Test port, Extension cable. (APC7 connector)
2	HP 11533A	Adapter APC7-SMA (Male)

After calibration, connect the D.U.T board and measure.

D.U.T board

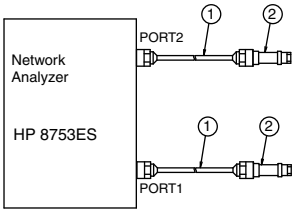
Dimension (mm inch)



Material: Glass PTFE (Double sided, Through hole)  
R-4737 (Panasonic Corporation)  
Thickness: t = 0.8mm .031inch  
Copper thickness: 18μm

Connector (SMA)  
Product name: R125 510 (RADIAL)

2) 75Ω type



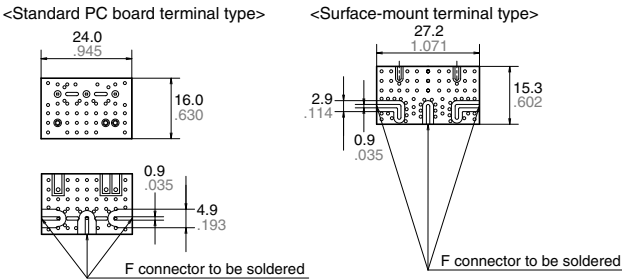
Connect connectors 1 and 2 respectively to PORT1 and PORT2. Perform calibration using the 3.5 mm .138 inch calibration kit (70Ω).

No.	Part number	Description
1	HP 11857B	75ΩF Test port, Return cable
2	85039-60011	Adapter 75ΩN (Female) – 75ΩF (Male)

After calibration, connect the D.U.T board and measure.

D.U.T board

Dimension (mm inch)



Material: Glass PTFE (Double sided, Through hole)  
R-4737 (Panasonic Corporation)  
Thickness: t = 0.8mm .031inch  
Copper thickness: 18μm

Connector (F)  
Product name: C05-0236 (KOMINE MUSEN DENKI)

For general cautions for use, please refer to the “General Application Guidelines”.

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Please contact .....

**Panasonic Corporation**

Electromechanical Control Business Division

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[industrial.panasonic.com/ac/e/](http://industrial.panasonic.com/ac/e/)

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