

High-Frequency Resonator

Piezoelectric Resonator (24 to 40 MHz)

FAR Family (C4 Series L Type)

■ DESCRIPTION

The C4 series (L Type) resonators apply to the frequency range 24 to 60 MHz.

They are fabricated on a lithium niobate (LiNaO_3) substrate, producing resonators with ultra compact and superior stability due to the high electromechanical coupling coefficient of the material.

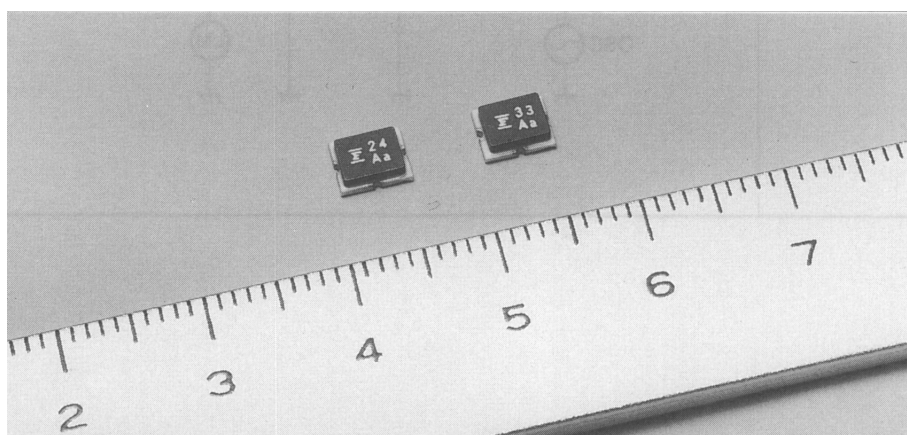
They use the third overtone resonance, so that they can oscillate at high frequency.

They include two loading capacitors inside and their package are chip type for surface mount. It contributes saving space and reducing mount cost.

■ FEATURES

- High frequency (24 to 60 MHz)
- Surface mount package (SMT)
- Suitable for the source of microcomputer clock
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

■ PACKAGE



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STANDARD CHARACTERISTICS

| Parameter | Series | C4 Series | Remarks |
|---|--------|---------------------------------------|---|
| Material | | Lithium Niobate (LiNbO ₃) | |
| Frequency | | 24 to 40 MHz | |
| Standard frequency | | See "■ Standard Frequency" | |
| Initial frequency deviation | | Within ±0.5% (M) | The ±0.3% (K) version can also be produced. |
| Temperature characteristic (-30°C to +85°C) | | Within 0.5% | Reference temperature: +25°C |
| Capacity of built-in capacitor | | 20±8 pF (standard) | 10±4 pF are also available. Capacity is specified by Fujitsu, considering matching data with applied IC (mainly microcomputer) |
| Aging stability | | Within ±0.1% | |
| Operating temperature | | -30°C to +85°C | |
| Storage temperature | | -40°C to +100°C | |

Standard measuring circuit

- Resonant frequency

24 MHz to 40 MHz
IC: MC74HCU04N × 2

- V_{CC} = 5 V DC
- R: Resonator
- C₁, C₂: Loading capacitors (built-in)

- Serial resonant resistance

Measuring instrument: Network analyzer

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■ STANDARD FREQUENCY

| Standard frequency (kHz) | Package size | Resonant resistance |
|--|--------------|---------------------------------|
| 24,000 kHz 33,869 kHz 40,000 kHz | L | 75 Ω max. (Symbol: 2) |

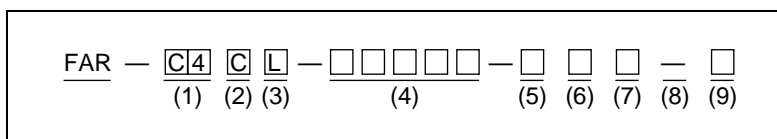
Note: Fujitsu can also develop applicable device in addition to standard devices if it's oscillation frequency is from 24 to 60 MHz.

■ NOTES ON USE

- Handle carefully
- Solder under the following conditions.
5 seconds max. at 230°C (PCB)
Recommended preheating is 150°C for one minute in order not to apply extreme heat to the resonator.
- Avoid extreme fluctuations in temperature.
- There is no specific direction in resonator mounting.
- Oscillation data should be examined when used in oscillation circuit with micon or other ICs.
- This is for reflow solder, not for flow solder.

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■ PART NUMBERING SYSTEM



(1) Series

| Series | Single crystal | Capacitor |
|--------|--------------------|-------------------------|
| C4 | LiNbO ₃ | With built-in capacitor |

(2) Package Type

| Specification | Type |
|---------------|------|
| C | CHIP |

(3) Package Type

| Specification | Size |
|---------------|-----------------|
| L | 5.0 × 4.0 × 1.6 |

(4) Frequency

See “■ Standard Frequency.”

(Example)

Unit: kHz (Specify in five digits.)

24.0 MHz → 24000

(5) Initial Frequency Deviation

| Specification | Deviation |
|---------------|-----------|
| K | ±0.3% |
| M | ±0.5% |

(6) Built-in Capacitor

| Specification | Capacitance |
|---------------|-------------|
| 0 | 20±8 pF |
| 1 | 10±4 pF |

(7) Resonant Resistance

| Specification | Resonant resistance |
|---------------|---------------------|
| 2 | 75Ω max. |

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(8) User-specific Special Symbols

| Specification | Description |
|----------------------|--|
| Name | No specifications, no taping specification |
| — | No specifications, with taping specification |
| A to Z | Serial number for custom design |

(9) Resonant Resistance

| Specification | Description |
|----------------------|--------------------------|
| R | 12 mm wide tape and reel |

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MARKING

The marking color varies with the capacitance of the built-in capacitor.

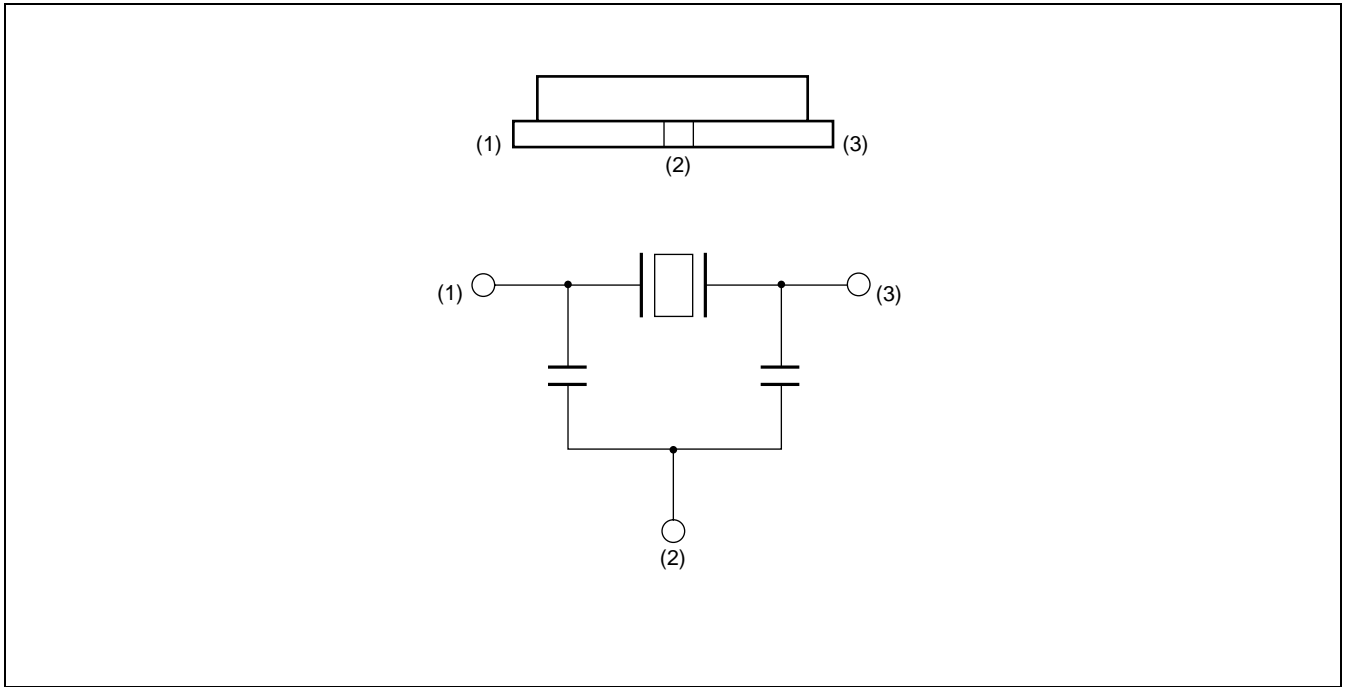
| Capacitance | Making color |
|-------------|--------------|
| 10 pF | Yellow |
| 20 pF | White |

Data code (EIAJ standard) is specified as follows in four-year cycle.

| Year | Month | Symbol | Year | Month | Symbol | Year | Month | Symbol | Year | Month | Symbol |
|--------------|-------|--------|--------------|-------|--------|----------------------|-------|-----------|----------------------|-------|--------|
| 1997 2001 | 1 | A | 1998 2002 | 1 | N | 1995 1999 2003 | 1 | a | 1996 2000 2004 | 1 | n |
| | 2 | B | | 2 | P | | 2 | b | | 2 | p |
| | 3 | C | | 3 | Q | | 3 | \bar{c} | | 3 | q |
| | 4 | D | | 4 | R | | 4 | d | | 4 | r |
| | 5 | E | | 5 | S | | 5 | e | | 5 | s |
| | 6 | F | | 6 | T | | 6 | f | | 6 | t |
| | 7 | G | | 7 | U | | 7 | g | | 7 | u |
| | 8 | H | | 8 | V | | 8 | h | | 8 | v |
| | 9 | J | | 9 | W | | 9 | j | | 9 | w |
| | 10 | K | | 10 | X | | 10 | k | | 10 | x |
| | 11 | L | | 11 | Y | | 11 | l | | 11 | y |
| | 12 | M | | 12 | Z | | 12 | m | | 12 | z |

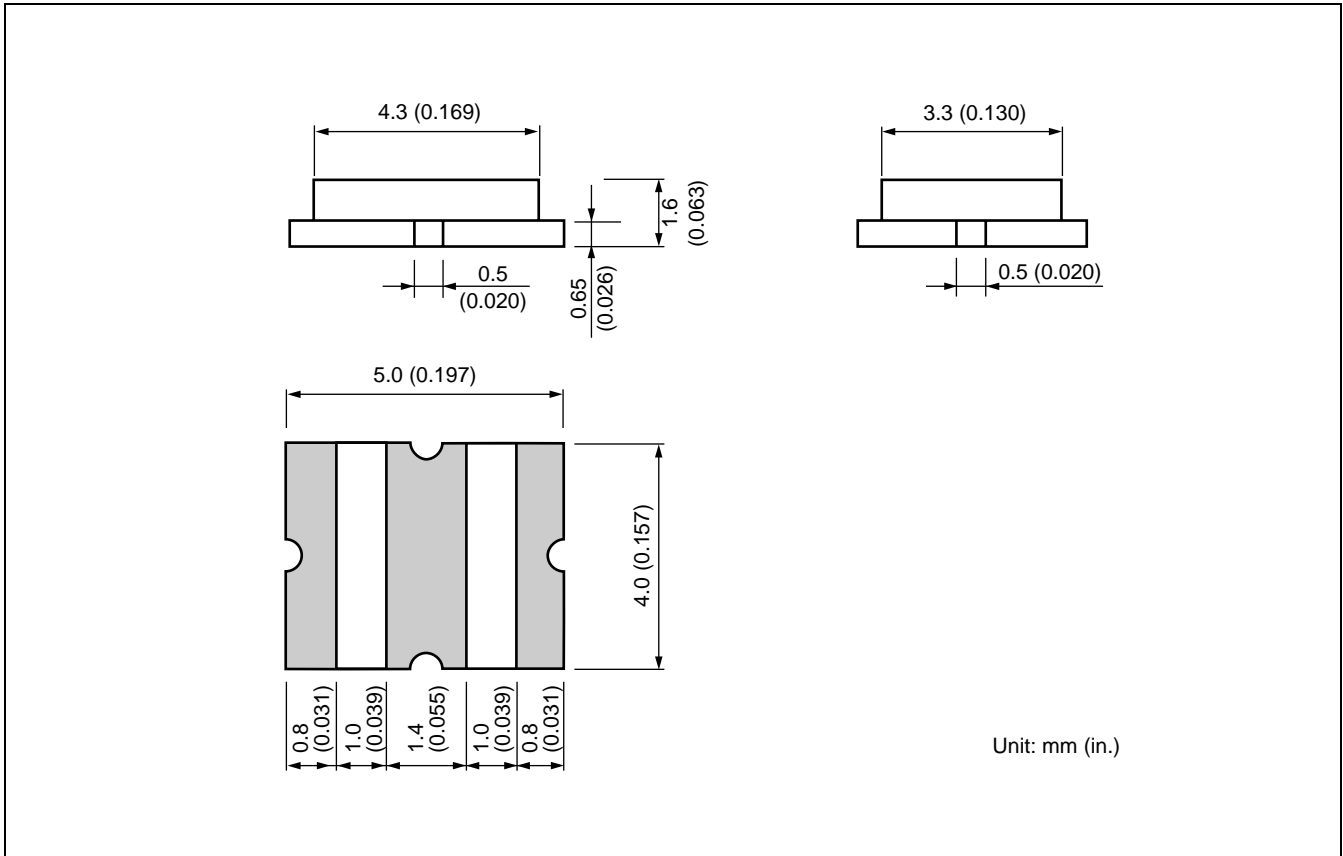
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■ PIN ASSIGNMENT



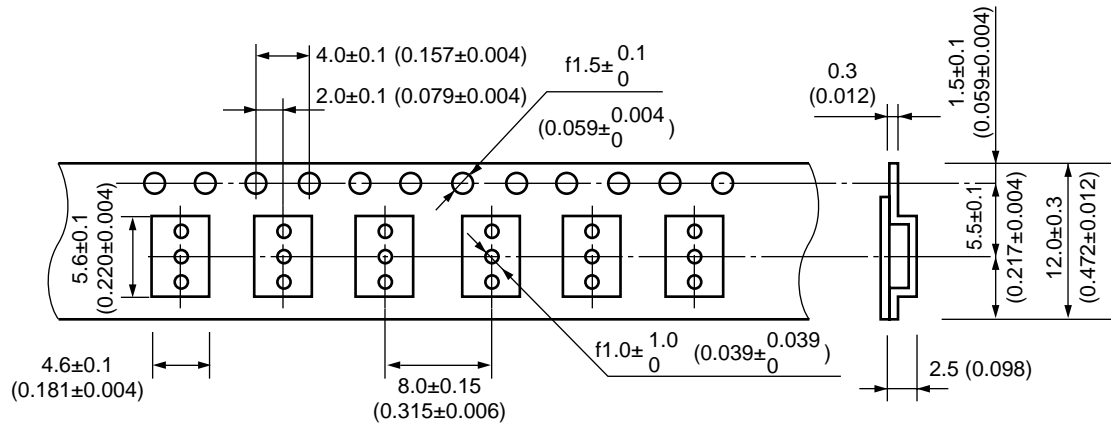
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■ DIMENSIONS

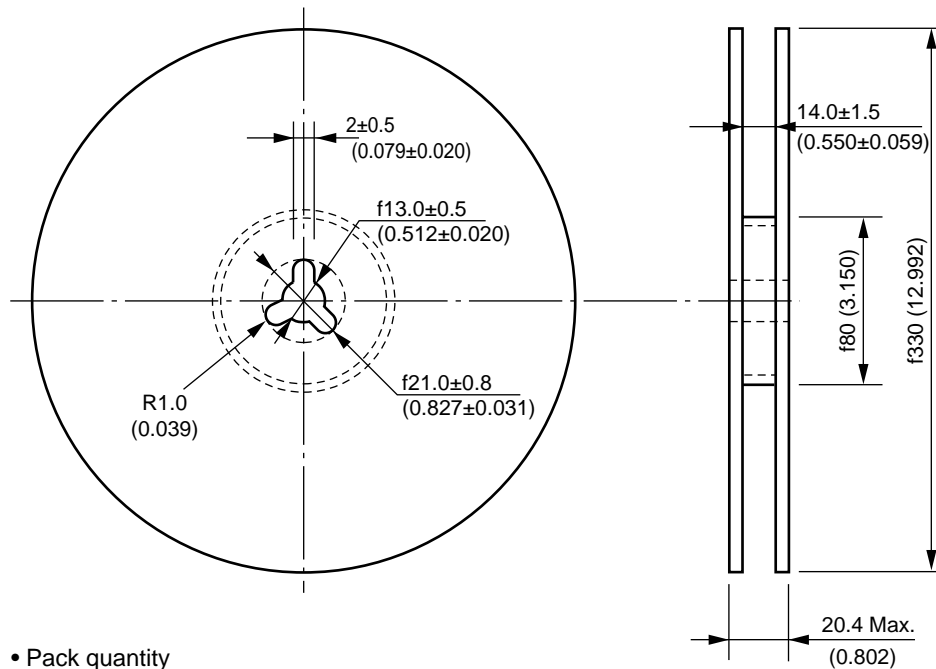


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■ TAPING FORM AND DIMENSIONS



• Reel dimensions



• Pack quantity

| Specification | Quantity |
|---------------|----------|
| R | 3,000 |

Unit: mm (in.)

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FUJITSU MEDIA DEVICES LIMITED

For further information please contact:

Japan

FUJITSU MEDIA DEVICE LIMITED
International Sales & Marketing DEPT.
Shin-Yokohama Square Bldg., 14F,
Shin-yokohama 2-3-12,
Kohoku-ku, Yokohama,
Kanagawa 222-0033, Japan
Tel: +81-45-471-0061
Fax: +81-45-471-0076

<http://www.fujitsu.co.jp/hypertext/fmd/English/index.html>

North and South America

FUJITSU MICROELECTRONICS, INC.
3545 North First Street,
San Jose, CA 95134-1804, U.S.A.
Tel: +1-408-922-9000
Fax: +1-408-922-9179

Customer Response Center
Mon. - Fri.: 7 am - 5 pm (PST)
Tel: +1-800-866-8608
Fax: +1-408-922-9179

<http://www.fujitsumicro.com/>

Europe

FUJITSU MICROELECTRONICS EUROPE GmbH
Am Siebenstein 6-10,
D-63303 Dreieich-Buchsschlag,
Germany
Tel: +49-6103-690-0
Fax: +49-6103-690-122

<http://www.fujitsu-fme.com/>

Asia Pacific

FUJITSU MICROELECTRONICS ASIA PTE. LTD.
#05-08, 151 Lorong Chuan,
New Tech Park,
Singapore 556741
Tel: +65-281-0770
Fax: +65-281-0220

<http://www.fmap.com.sg/>

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