

*Resonator*

# Piezoelectric Resonator (4 to 23.9 MHz)

## FAR Family (C4 series N type)

### ■ DESCRIPTION

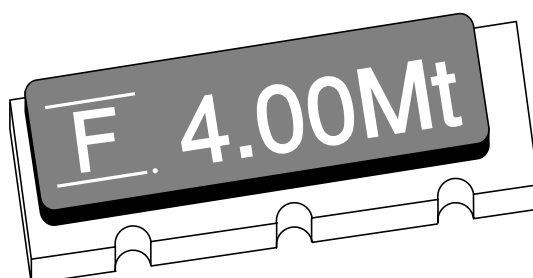
Fujitsu resonators C4 series (N type) feature originally developed single crystals with a high electro-mechanical coefficient (LiNbO<sub>3</sub>: lithium niobate), the result is very compact packaging.

C4 series (N type) with built-in capacitors for exclusive use in microcomputer clocks, and this series is ultra low profile CHIP type device for surface-mount (SMT).

### ■ FEATURES

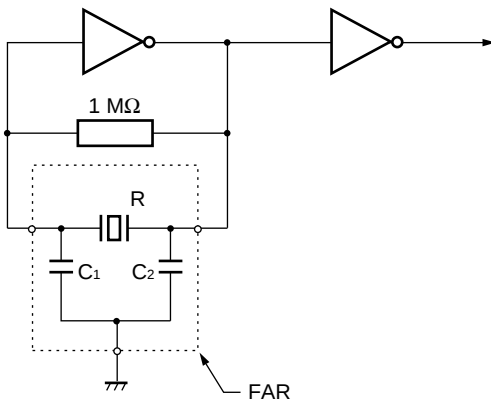
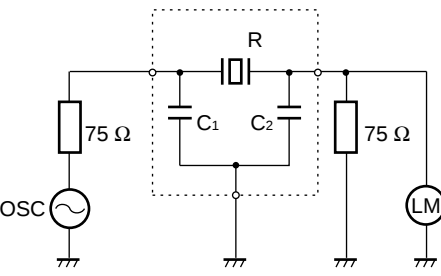
- Ultra low profile H = 1.6 mm
- Direct oscillation in 4 to 23.9 MHz frequency.
- Suitable for the source of microcomputer clock
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

### ■ PACKAGE



# FAR Family (C4 series N type)

## ■ STANDARD CHARACTERISTICS

| Parameter \ Series                          | C4 series (N type)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  | Remarks                                                                                                                                  |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                    | Lithium Niobate (LiNbO <sub>3</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                                                                                                                                          |
| Frequency                                   | 4 to 17 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 17.1 to 23.9 MHz |                                                                                                                                          |
| Standard frequency                          | See "■ Standard Frequency."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                                                                                                                                          |
| Initial frequency deviation                 | ±0.3% (K)<br>±0.5% (M)<br>±1.0% (L)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ±1.0% (L)        | When a frequency of more than 17.1 MHz, only L deviation type can be made.                                                               |
| Temperature characteristic (−20°C to +60°C) | ±0.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                                                                                                                                          |
| Capacity of built-in capacitor              | 20±8 pF (standard)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  | 10±4 pF, 30±8 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                  | <p>• Resonant frequency</p>  <p>Less than 4 MHz to 10 MHz<br/>IC: 1/6MB84069B×2<br/>10 MHz to 20.0 MHz<br/>IC: 1/6MC74HC04×2<br/>20.1 MHz to 23.9 MHz<br/>IC: 1/6MC74HCU04×2</p> <ul style="list-style-type: none"> <li>• V<sub>cc</sub>: 5 V DC</li> <li>• R: Resonator</li> <li>• C<sub>1</sub>, C<sub>2</sub>: Loading capacitors (built-in)</li> </ul> <p>• Serial resonant resistance</p>  <p>R: Resonator<br/>Measuring instrument: Network analyzer</p> |                  |                                                                                                                                          |

# FAR Family (C4 series N type)

## ■ STANDARD FREQUENCY

| Standard frequency (kHz)                                                                                                                     | Package size | Resonant resistance              |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------|
| 4,000<br>4,194<br>4,915                                                                                                                      | N            | 300 $\Omega$ max.<br>(Symbol: 0) |
| 6,000<br>6,144<br>7,373<br>8,000<br>8,388<br>9,830<br>10,000<br>11,059<br>12,000<br>12,288<br>14,746<br>16,000<br>16,934<br>19,661<br>20,000 | N            | 75 $\Omega$ max.<br>(Symbol: 2)  |

**Notes:** • Fujitsu can also develop applicable device in addition to standard devices if it's oscillation frequency is from 4 to 23.9 MHz.

• Resonant resistance of the part other than standard, Fujitsu should specify its resonant resistance according to applied frequency. (See “• Frequency and standard resonant resistance.”)

• Frequency and standard resonant resistance

| Frequency         | Standard resonant resistance  |
|-------------------|-------------------------------|
| 4.00 to 5.99 MHz  | 300 $\Omega$ max. (Symbol: 0) |
| 6.00 to 23.99 MHz | 75 $\Omega$ max. (Symbol: 2)  |

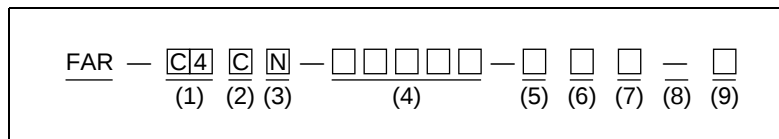
**Note:** Resonant resistance of custom designed part should be specified considering matching condition with applicable IC by Fujitsu.

## ■ 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.

# FAR Family (C4 series N type)

## ■ PART NUMBERING SYSTEM



(1) Series

| Series | Single crystal     | Capacitor               |
|--------|--------------------|-------------------------|
| C4     | LiNbO <sub>3</sub> | With built-in capacitor |

(2) Package Type

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

(3) Package Type

| Specification | Size            |
|---------------|-----------------|
| N             | 8.0 × 3.2 × 1.6 |

(4) Frequency

(Example) Unit: kHz (Specify in five digits.)

| Frequency | Specification |
|-----------|---------------|
| 7.373 MHz | 07373         |

See “■ Standard Frequency”.

(5) Initial Frequency Deviation

| Specification | Deviation |
|---------------|-----------|
| K             | ±0.3%     |
| M             | ±0.5%     |
| L             | ±1.0%     |

(6) Built-in Capacitor

| Specification | Capacitance |
|---------------|-------------|
| 0             | 20±8 pF     |
| 1             | 10±4 pF     |
| 2             | 30±8 pF     |

(7) Resonant Resistance

| Specification | Resonant resistance |
|---------------|---------------------|
| 0             | 300 Ω max.          |
| 2             | 75 Ω max.           |

# FAR Family (C4 series N type)

## (8) User-specific Special Symbols

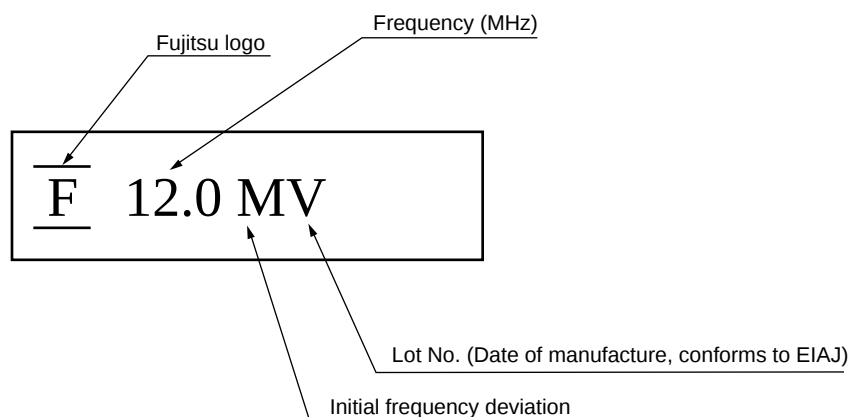
| Specification | Description                                  |
|---------------|----------------------------------------------|
| Name          | No specifications, no taping specification   |
| —             | No specifications, with taping specification |
| A to Z        | Serial number for custom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

## (9) Resonant Resistance

| Specification | Description                               |
|---------------|-------------------------------------------|
| R             | 16 mm wide emboss tape coiled 3,000 times |

# FAR Family (C4 series N type)

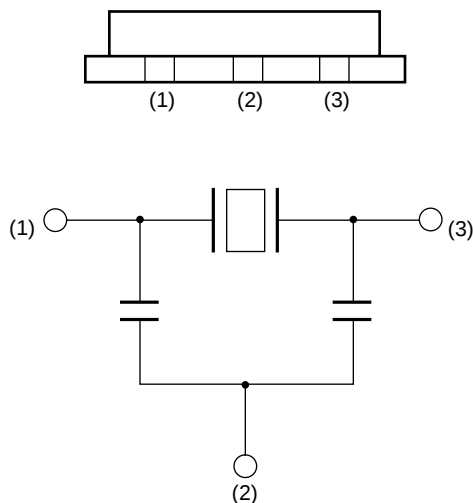
## ■ MARKING



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

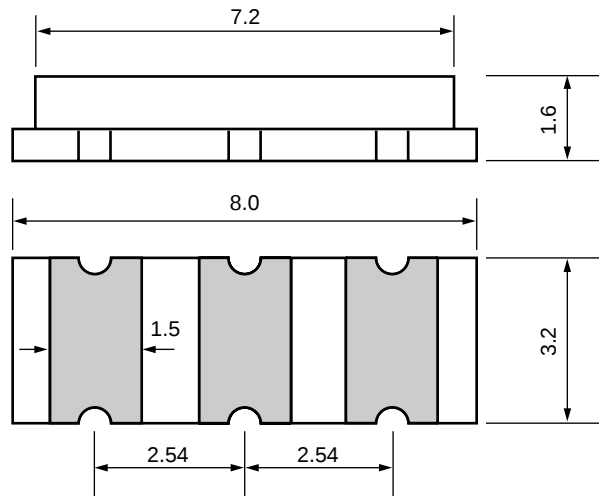
| Capacitance | Marking color |
|-------------|---------------|
| 10 pF       | Yellow        |
| 20 pF       | White         |
| 30 pF       | Gray          |

## ■ PIN ASSIGNMENT

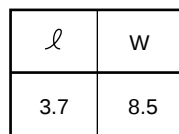


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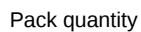
## ■ DIMENSIONS



## ■ TAPING FORM AND DIMENSIONS



Reel form



|          |
|----------|
| Quantity |
| 3,000    |

Unit: mm

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