

## *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 ( $\text{LiNaO}_3$ ) substrate, producing resonators with ultra compact and superior stability due to the high electromechanical coupling coefficient of the material.

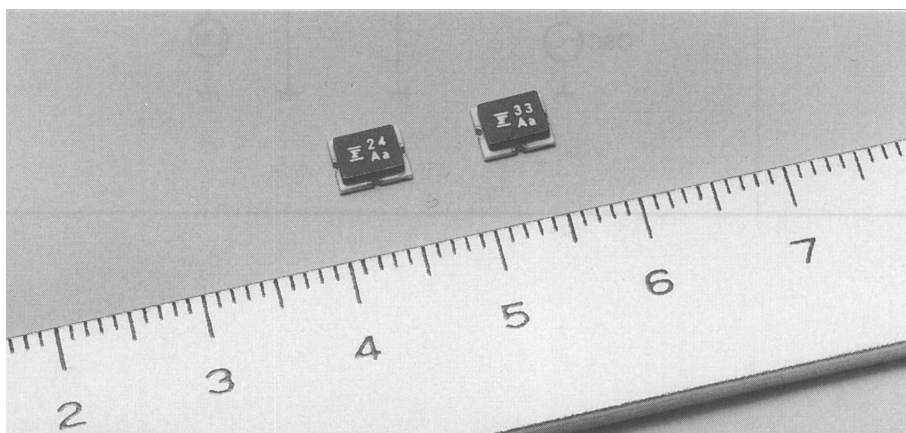
They use the third overtone resonance, so that they can oscillate at high frequency.

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

### ■ FEATURES

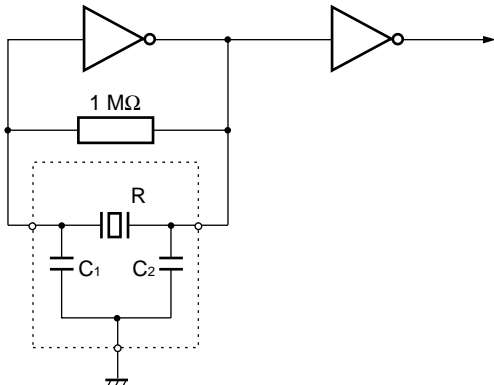
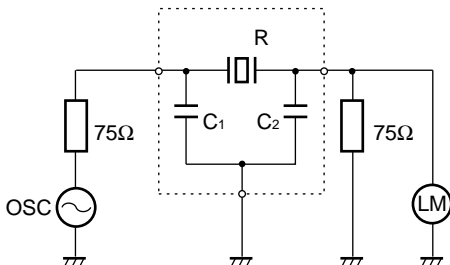
- High frequency (24 to 60 MHz)
- Surface mount package (SMT)
- Suitable for the source of microcomputer clock
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

### ■ PACKAGE



# FAR Family (C4 series L type)

## ■ STANDARD CHARACTERISTICS

Parameter	Series	C4 Series	Remarks
Material		Lithium Niobate (LiNbO <sub>3</sub> )	
Frequency		24 to 40 MHz	
Standard frequency		See "■ Standard Frequency"	
Initial frequency deviation		Within $\pm 0.5\%$ (M)	The $\pm 0.3\%$ (K) version can also be produced.
Temperature characteristic ( $-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ )		Within 0.5%	Reference temperature: $+25^{\circ}\text{C}$
Capacity of built-in capacitor		$20 \pm 8$ pF (standard)	$10 \pm 4$ pF are also available. Capacity is specified by Fujitsu, considering matching data with applied IC (mainly microcomputer)
Aging stability		Within $\pm 0.1\%$	
Operating temperature		$-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	
Storage temperature		$-40^{\circ}\text{C}$ to $+100^{\circ}\text{C}$	
Standard measuring circuit		<p>• Resonant frequency</p>  <p>24 MHz to 40 MHz IC: MC74HCU04N <math>\times 2</math></p> <ul style="list-style-type: none"> <li>• <math>V_{CC} = 5</math> 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>Measuring instrument: Network analyzer</p>	

# FAR Family (C4 series L type)

## ■ STANDARD FREQUENCY

Standard frequency (kHz)	Package size	Resonant resistance
24,000 kHz 33,869 kHz 40,000 kHz	L	75 $\Omega$ max. (Symbol: 2)

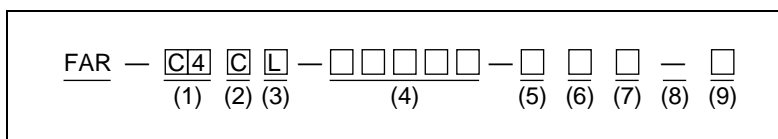
Note: Fujitsu can also develop applicable device in addition to standard devices if it's oscillation frequency is from 24 to 60 MHz.

## ■ 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 micron 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 <sub>3</sub>	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.

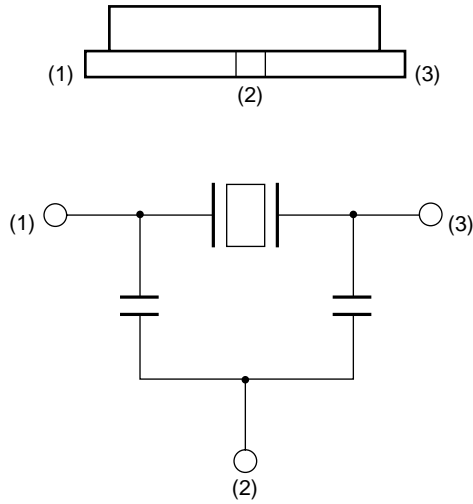
Capacitance	Making color
10 pF	Yellow
20 pF	White

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

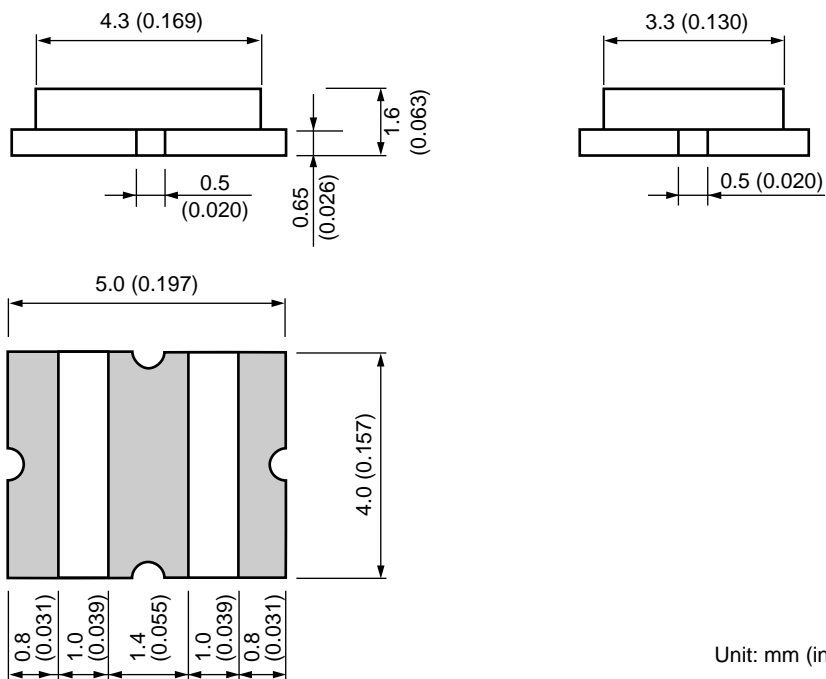
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## ■ PIN ASSIGNMENT



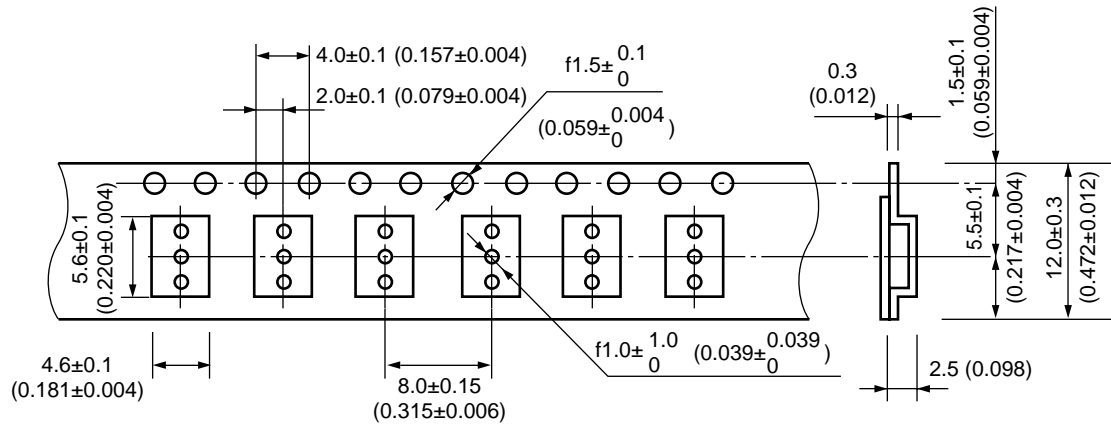
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## ■ DIMENSIONS

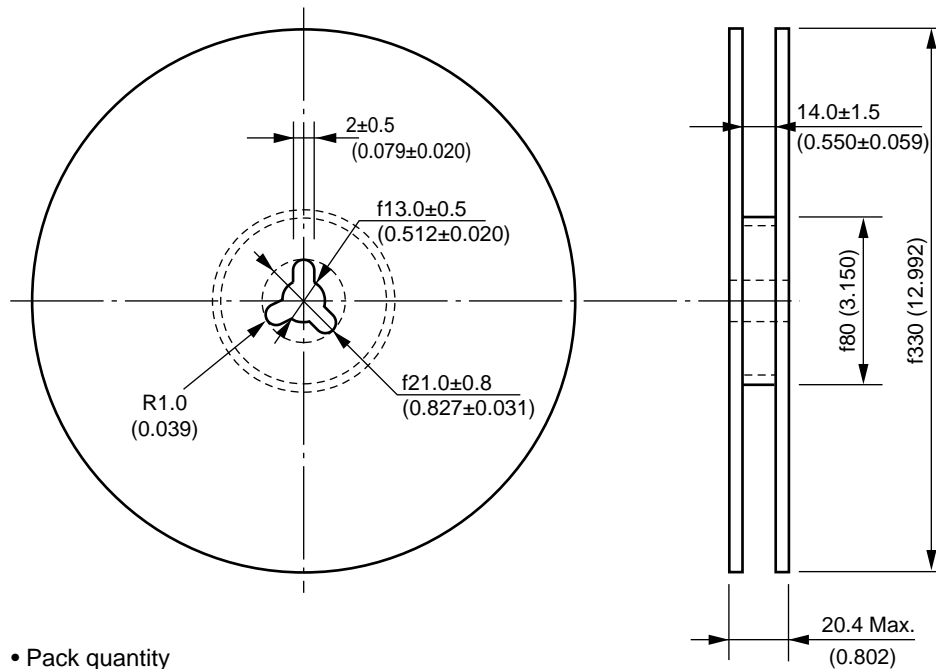


# FAR Family (C4 series L type)

## ■ TAPING FORM AND DIMENSIONS



### • Reel dimensions



### • Pack quantity

Specification	Quantity
R	3,000

Unit: mm (in.)

# FAR Family (C4 series L type)

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