

## Resonator

# Piezoelectric Resonator (4 to 16 MHz)

## FAR Family (C4 series P/Q type) For Motor Application

### ■ DESCRIPTION

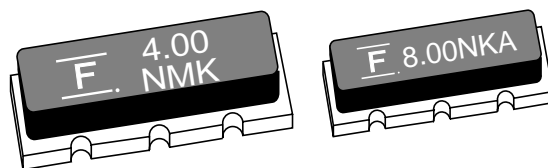
Fujitsu resonators C4 series (P/Q type) feature single crystals with a high electro-mechanical coefficient (LiNbO<sub>3</sub>: lithium niobate), the result is very compact packaging.

C4 series (P/Q type) with built-in capacitors for exclusive use in microcomputer clocks, and this series is chip type device for surface-mount and suitable for motor application due to its high reliability package.

### ■ FEATURES

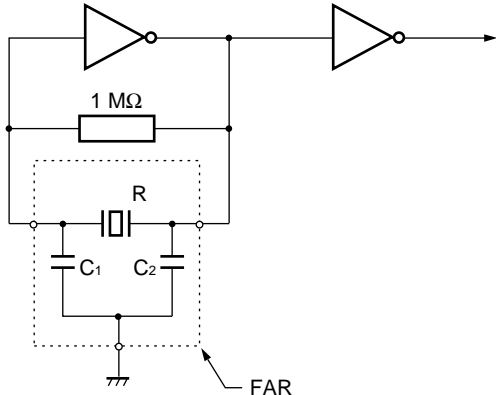
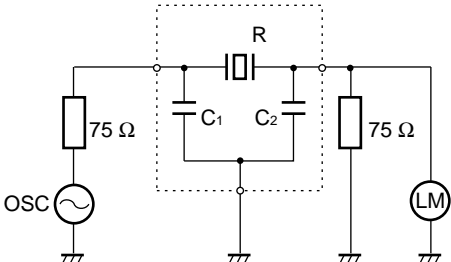
- Wide frequency range in 4 to 16 MHz
- Suitable for microcomputer clock
- PCT (121 °C, 2 atms, 96 hours) is guaranteed for Motor application.
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

### ■ PACKAGE



# FAR Family (C4 series P/Q type)

## ■ STANDARD CHARACTERISTICS

Parameter	Series	C4 series (P/Q type)	Remarks
Material		Lithium Niobate (LiNbO <sub>3</sub> )	
Frequency		4 to 16 MHz	
Standard frequency		See "■ Standard Frequency."	
Initial frequency deviation		±0.5% (M)	The ±0.3% (K) version can also be produced.
Temperature characteristic (-40°C to +105°C)		± <sup>0.9</sup> / <sub>1.0</sub> % (M)	Reference temperature: +25°C
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%	For ten years at room temperature
PCT		96 hours guaranteed	Unstaturated PCT: 121°C 2 atmospheric pressures
Operating temperature		-40°C to +105°C	
Storage temperature		-55°C to +105°C	
Standard measuring circuit		<ul style="list-style-type: none"> <li>Resonant frequency</li> </ul>  <ul style="list-style-type: none"> <li>4 MHz to 10 MHz IC: MB84069B×2</li> <li>10 MHz to 16.0 MHz IC: MC74HC04×2</li> <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> <ul style="list-style-type: none"> <li>Serial resonant resistance</li> </ul>  <ul style="list-style-type: none"> <li>R: Resonator</li> <li>Measuring instrument: Network analyzer</li> </ul>	

# FAR Family (C4 series P/Q type)

## ■ STANDARD FREQUENCY

Standard frequency (kHz)	Package size	Resonant resistance
4,000	P	150 $\Omega$ max. (Symbol: 01)
8,000 10,000 12,000 16,000	Q	75 $\Omega$ max. (Symbol: 02)

- Notes:**
- Fujitsu can also develop applicable device in addition to standard devices if its oscillation frequency is from 4 to 16 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

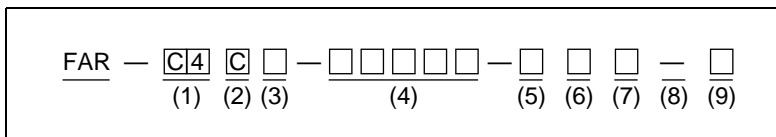
Frequency	Standard resonant resistance
4.00 to 5.99 MHz	150 $\Omega$ max. (Symbol: 1)
6.00 to 16.00 MHz	75 $\Omega$ max. (Symbol: 2)

## ■ 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 microcomputer or other ICs.
- This is for reflow solder, not for flow solder.

# FAR Family (C4 series P/Q 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 Size

Specification	Size
P	Large (4.0 to 5.9 MHz)
Q	Small (6.0 to 16.0 MHz)

(4) Frequency

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

Frequency	Specification
8.000 MHz	08000

See “■ Standard Frequency”.

(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
2	30±8 pF

# FAR Family (C4 series P/Q type)

## (7) Resonant Resistance

Specification	Resonant resistance
1	150 $\Omega$
2	75 $\Omega$

## (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) Taping Specification

Specification	Description
R	16 mm wide emboss tape (3,000 pcs)

# FAR Family (C4 series P/Q type)

## MARKING

The diagram shows a rectangular marking area containing the text 'F 8.00 NMK'. Arrows point from labels to specific parts of the marking: 'Fujitsu logo' points to the 'F', 'Frequency (MHz)' points to '8.00', 'Material symbol' points to 'N', and 'Lot No. (Date of manufacture, conforms to EIAJ)' points to 'MK'. Below the 'Material symbol' label, it specifies 'N: LiNbO<sub>3</sub>'. Below the 'Initial frequency deviation' label, it specifies 'Initial frequency deviation'.

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

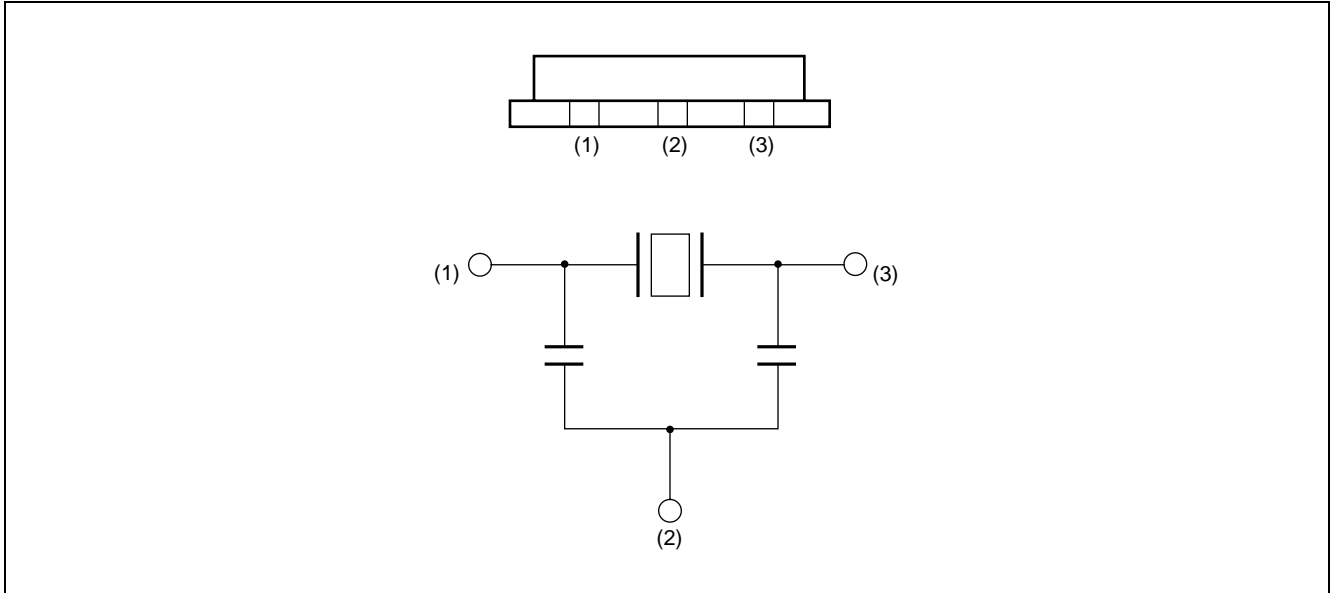
Capacitance	Marking color
10 pF	Yellow
20 pF	White
30 pF	Gray

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

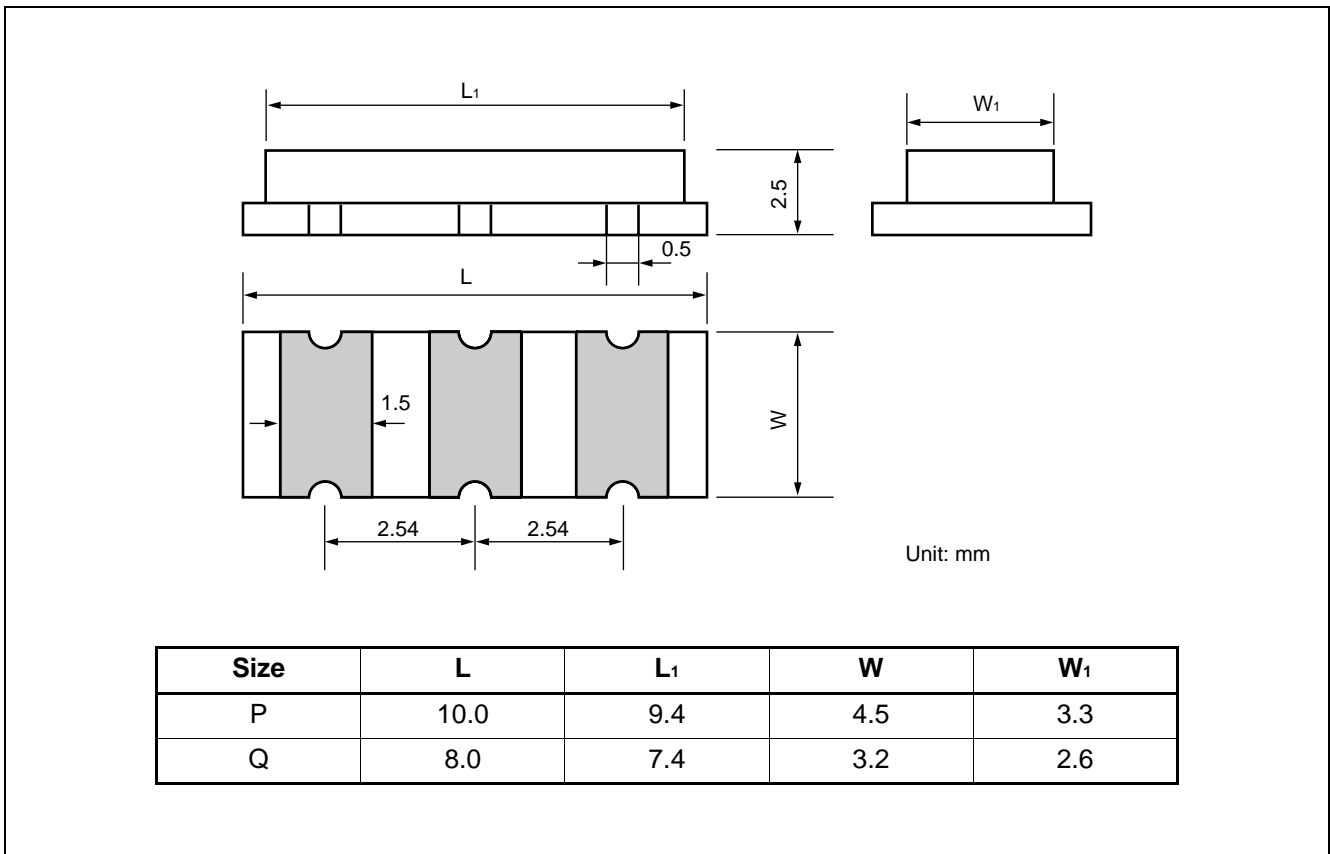
Year	Month	Symbol	Year	Month	Symbol	Year	Month	Symbol	Year	Month	Symbol
1997 2001	1	A	1998 2002	1	N	1999 2003	1	a	2000 2004	1	n
	2	B		2	P		2	b		2	o
	3	C		3	Q		3	c		3	g
	4	D		4	R		4	d		4	r
	5	F		5	S		5	e		5	s
	6	G		6	T		6	f		6	t
	7	H		7	U		7	g		7	u
	8	I		8	V		8	h		8	v
	9	J		9	W		9	j		9	w
	10	K		10	X	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

# FAR Family (C4 series P/Q type)

## ■ PIN ASSIGNMENT

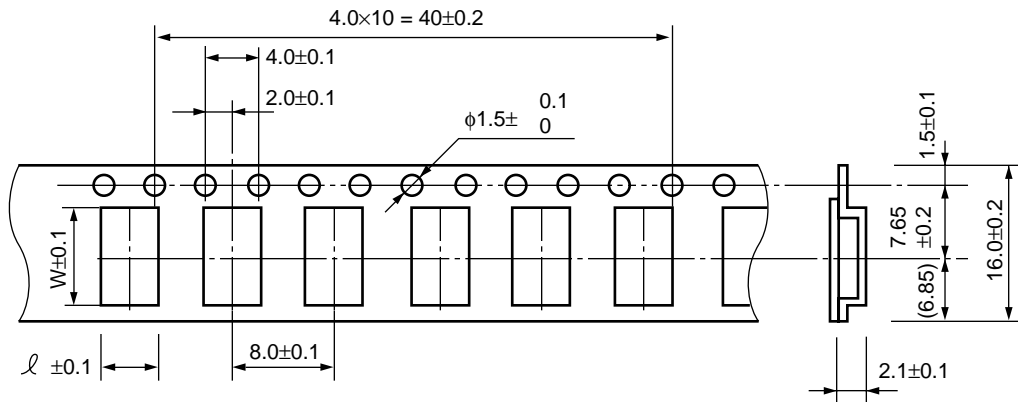


## ■ DIMENSIONS



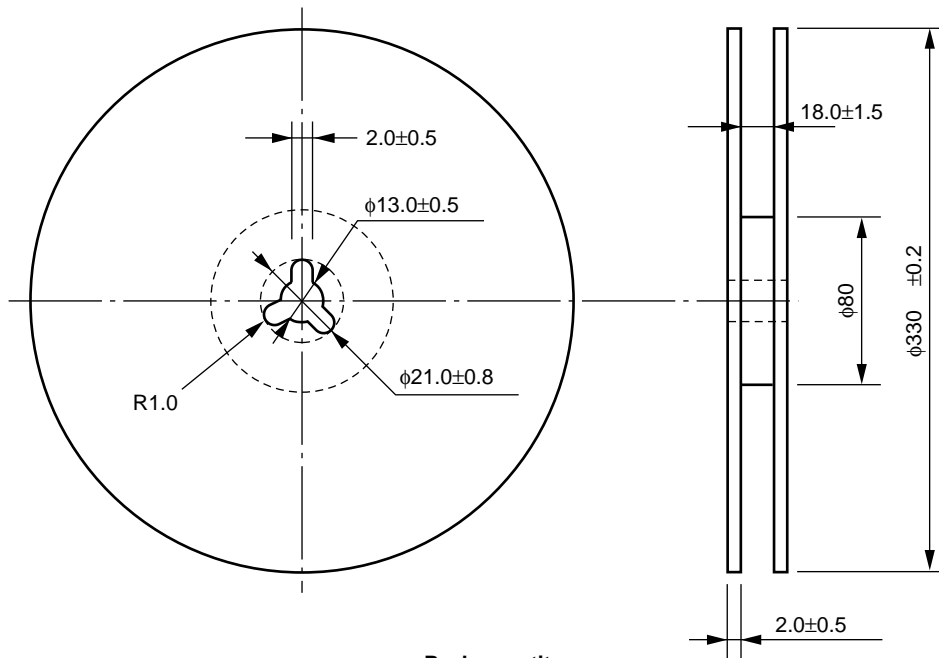
# FAR Family (C4 series P/Q type)

## ■ TAPING FORM AND DIMENSIONS



Package size	$l$	W	t
P	5.0	10.5	3.0
Q	3.7	8.5	2.8

Reel form



• Pack quantity

Package size	Quantity
P, Q	3,000

Unit: mm



# FAR Family (C4 series P/Q type)

## FUJITSU LIMITED

*For further information please contact:*

### **Japan**

FUJITSU LIMITED  
Corporate Global Business Support Division  
Electronic Devices  
KAWASAKI PLANT, 4-1-1, Kamikodanaka  
Nakahara-ku, Kawasaki-shi  
Kanagawa 211-88, Japan  
Tel: (044) 754-3763  
Fax: (044) 754-3329

### **North and South America**

FUJITSU MICROELECTRONICS, INC.  
Semiconductor Division  
3545 North First Street  
San Jose, CA 95134-1804, U.S.A.  
Tel: (408) 922-9000  
Fax: (408) 432-9044/9045

### **Europe**

FUJITSU MIKROELEKTRONIK GmbH  
Am Siebenstein 6-10  
63303 Dreieich-Buchsschlag  
Germany  
Tel: (06103) 690-0  
Fax: (06103) 690-122

### **Asia Pacific**

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

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