

Resonator

Piezoelectric Resonator (4 to 16 MHz)

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

■ DESCRIPTION

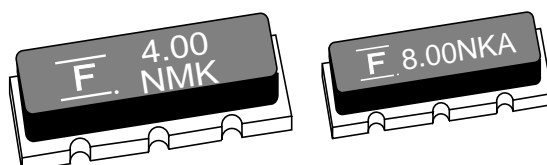
Fujitsu resonators C4 series (P/Q type) feature single crystals with a high electro-mechanical coefficient (LiNbO₃: lithium niobate), the result is very compact packaging.

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

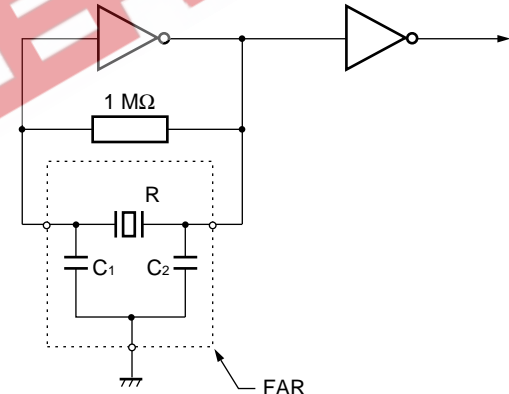
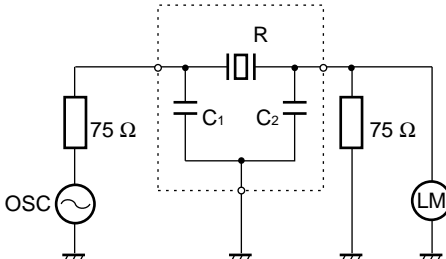
- Wide frequency range in 4 to 16 MHz
- Suitable for microcomputer clock
- PCT (121 °C, 2 atms, 96 hours) is guaranteed for Motor application.
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

■ PACKAGE



FAR Family (C4 series P/Q type)

■ STANDARD CHARACTERISTICS

Parameter	Series	C4 series (P/Q type)	Remarks
Material		Lithium Niobate (LiNbO ₃)	
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)		± ^{0.9} / _{1.0} % (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"> • Resonant frequency  <ul style="list-style-type: none"> • Serial resonant resistance 	<p>4 MHz to 10 MHz IC: MB84069B×2</p> <p>10 MHz to 16.0 MHz IC: MC74HC04×2</p> <ul style="list-style-type: none"> • Vcc: 5 V DC • R: Resonator • C1, C2: Loading capacitors (built-in) <p>R: Resonator Measuring instrument: Network analyzer</p>

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■ STANDARD FREQUENCY

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

- Notes:**
- Fujitsu can also develop applicable device in addition to standard devices if it's 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

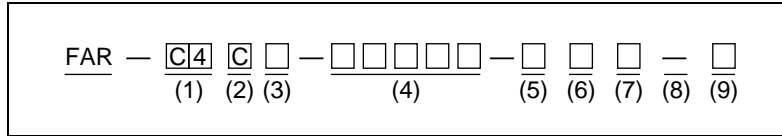
Frequency	Standard resonant resistance
4.00 to 5.99 MHz	150 Ω max. (Symbol: 1)
6.00 to 16.00 MHz	75 Ω max. (Symbol: 2)

■ 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.

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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 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

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(7) Resonant Resistance

Specification	Resonant resistance
1	150 Ω
2	75 Ω

(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)

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MARKING

The diagram shows a rectangular marking area containing the text "F 8.00 NMK".

- Fujitsu logo:** Points to the letter "F".
- Frequency (MHz):** Points to the number "8.00".
- Material symbol:** Points to the letter "N". Below it, it says "N: LiNbO₃".
- Lot No. (Date of manufacture, conforms to EIAJ):** Points to the letters "MK".
- Initial frequency deviation:** Points to the number "00" in "8.00".

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

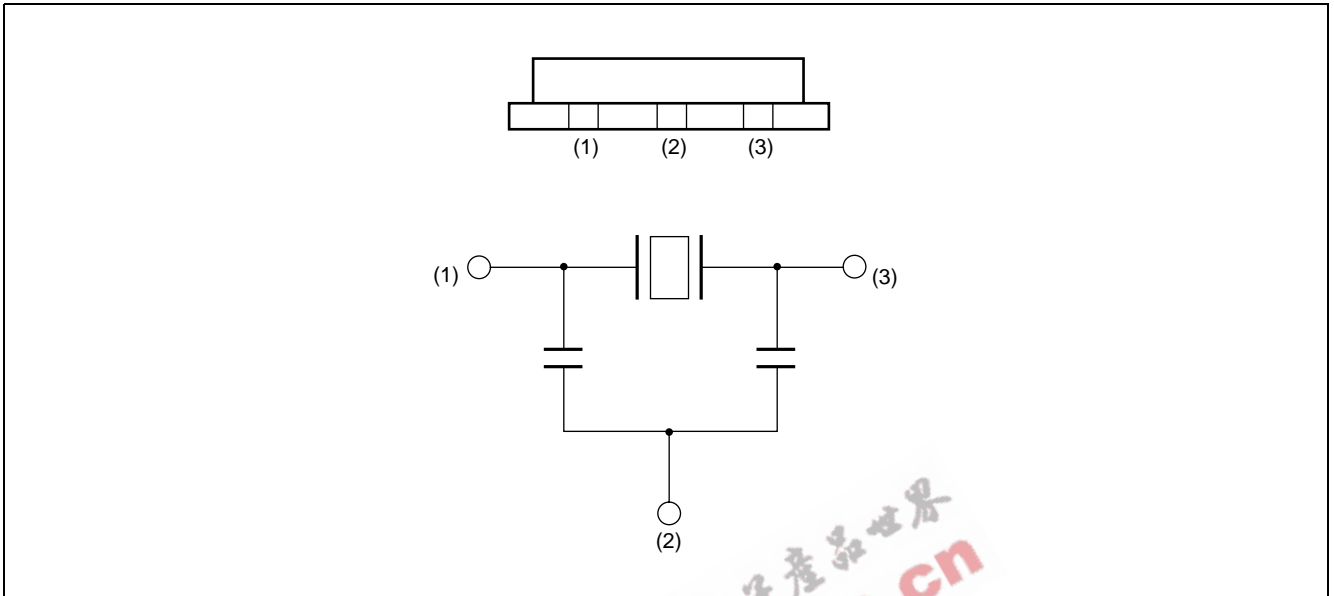
Capacitance	Marking color
10 pF	Yellow
20 pF	White
30 pF	Gray

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

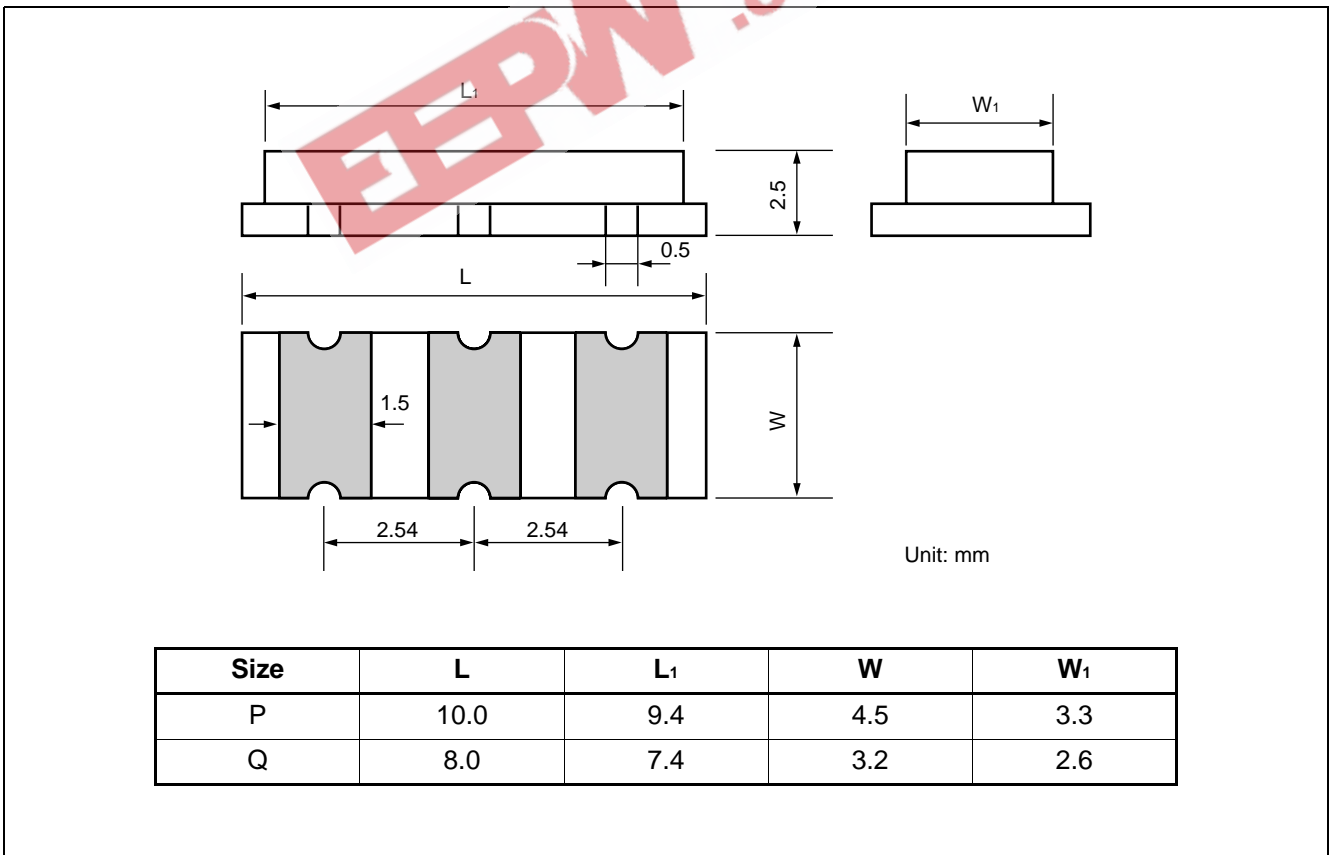
Year	Month	Symbol	Year	Month	Symbol	Year	Month	Symbol	Year	Month	Symbol
1997 2001	1	A	1998 2002	1	N	1999 2003	1	a	2000 2004	1	n
	2	B		2	P		2	b		2	o
	3	C		3	Q		3	c		3	q
	4	D		4	R		4	d		4	r
	5	F		5	S		5	e		5	s
	6	G		6	T		6	f		6	t
	7	H		7	U		7	g		7	u
	8	I		8	V		8	h		8	v
	9	J		9	W		9	j		9	w
	10	K		10	X	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

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PIN ASSIGNMENT

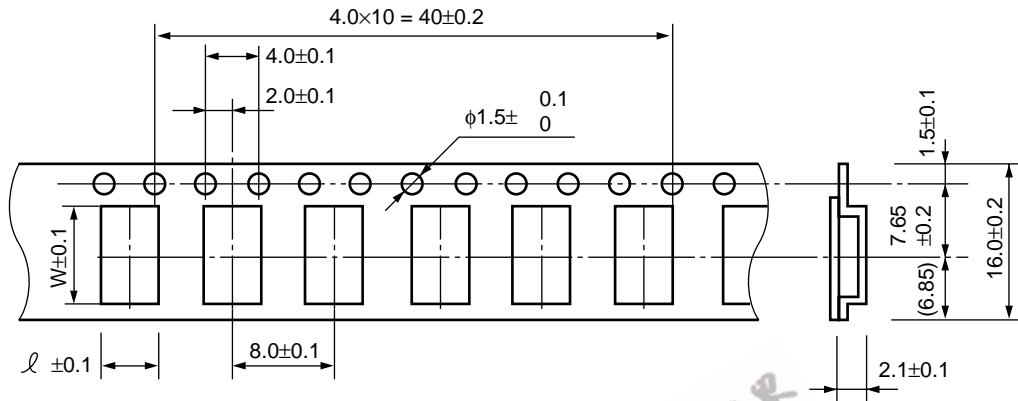


DIMENSIONS



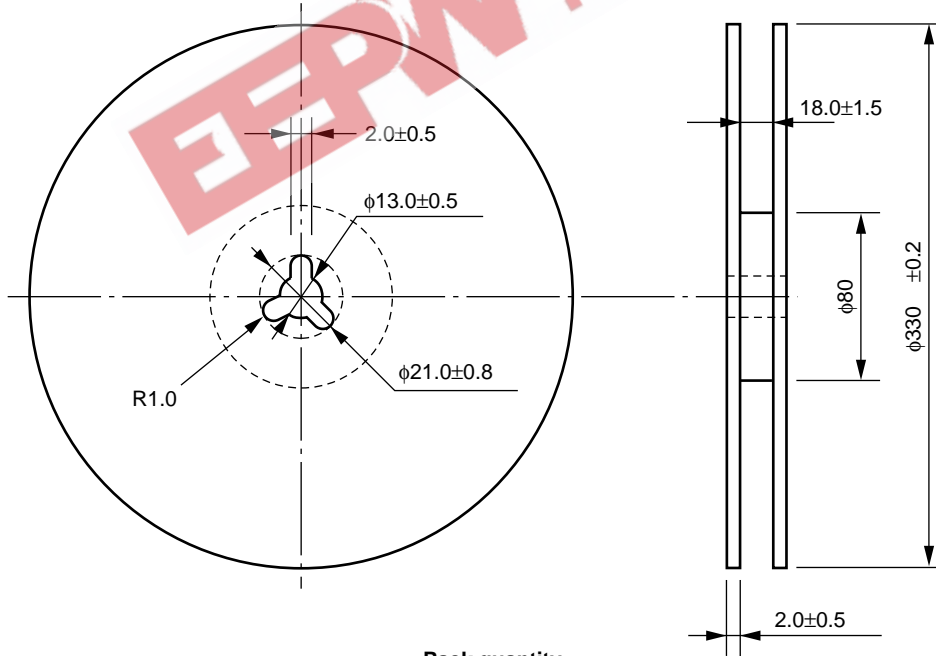
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■ TAPING FORM AND DIMENSIONS



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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