FUJITSU SEMICONDUCTOR
DATA SHEET

DS07-10204-1E

Resonator

Piezoelectric Resonator (4 to 16 MHz)

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

■ DESCRIPTION

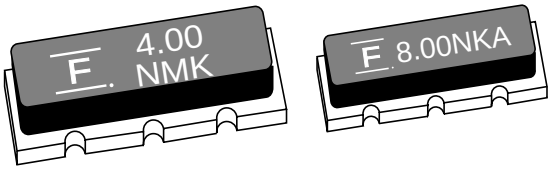
Fujitsu resonators C4 series (P/Q type) feature single crystals with a high electro-mechanical coefficient ($LiNbO_3$: lithium niobate), the result is very compact packaging.

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 appication due to its high reliability package.

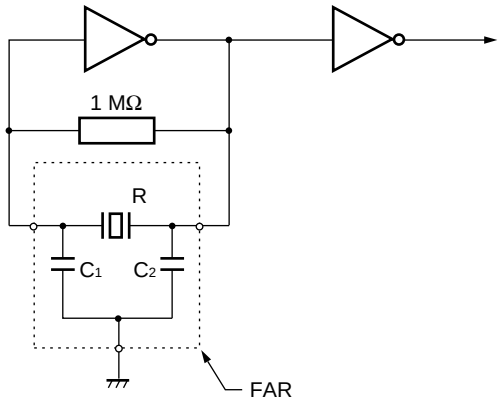
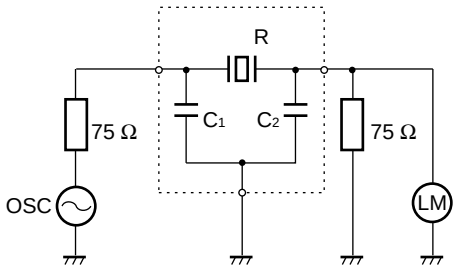
■ FEATURES

- 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



■ 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)	$\pm \frac{0.9}{1.0}$% (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	Unsturated PCT: 121°C 2 atomospheric pressures
Operating temperature	–40°C to +105°C	
Storage temperature	–55°C to +105°C	
Standard measuring circuit	• Resonant frequency  4 MHz to 10 MHz IC: MB84069B×2 10 MHz to 16.0 MHz IC: MC74HC04×2 • V_{CC}: 5 V DC • R: Resonator • C_1, C_2: Loading capacitors (built-in) • Serial resonant resistance  R: Resonator Measuring instrument: Network analyzer	

■ 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.

■ PART NUMBERING SYSTEM

FAR — C4 C □ — □□□□□ — □ □ □ — □
(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) Series

Series	Single crystal	Capacitator
C4	$LiNbO_3$	With built-in capacitator

(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

(7) Resonant Resistance

Specification	Resonant resistance
1	150 Ω
2	75 Ω

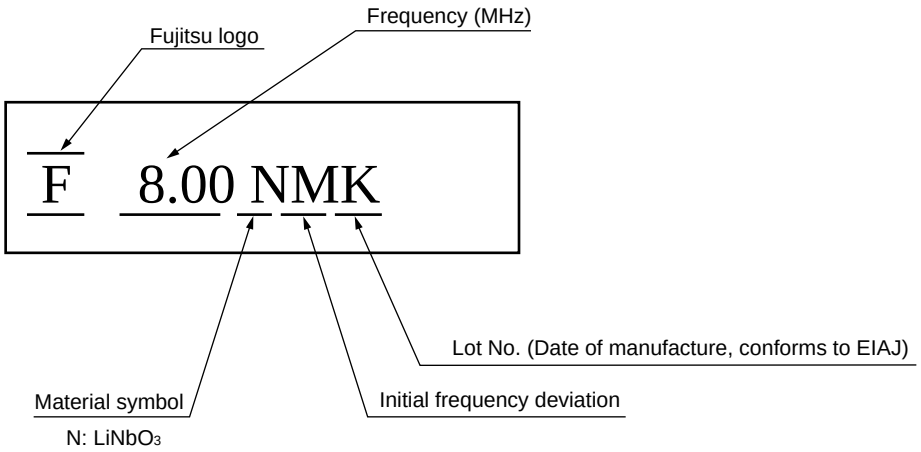
(8) User-specific Special Symbols

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)

■ MARKING



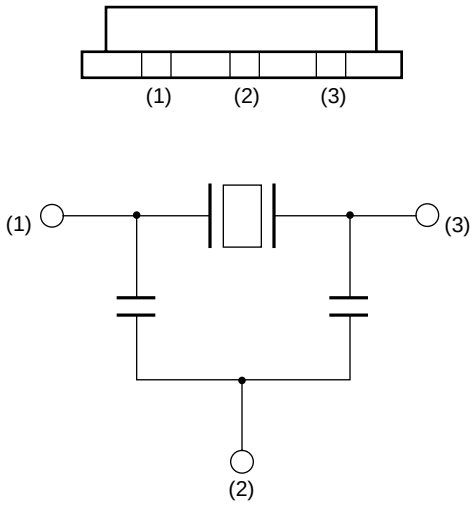
Note: The marking color varies with the capacitance of the built-in capacitator.

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

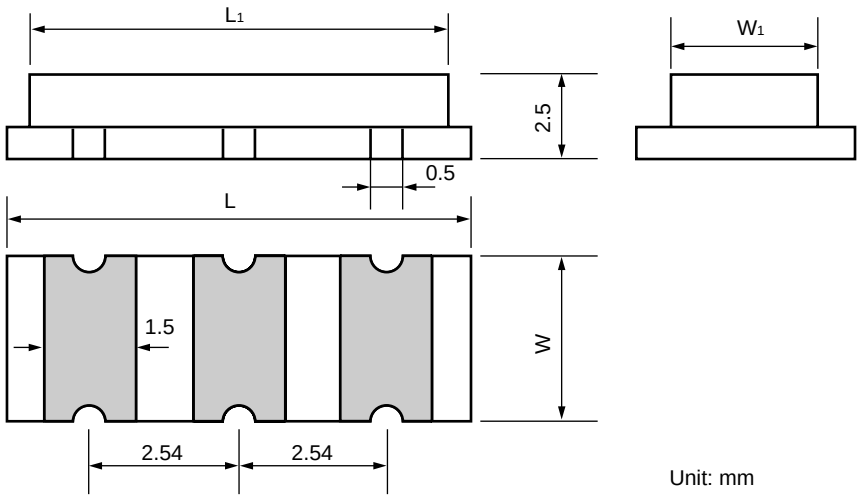
Data code (EIAJ standard) is specified as follows in four-year cycle.

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	p
	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

■ PIN ASSIGNMENT



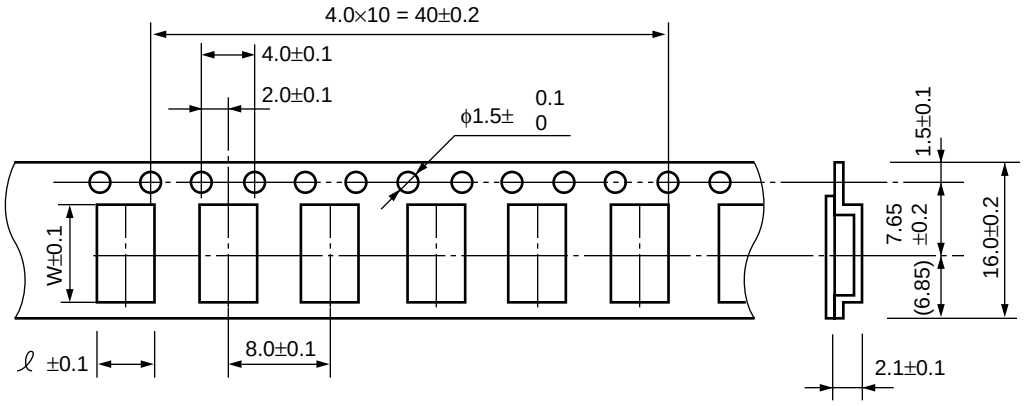
■ DIMENSIONS



Unit: mm

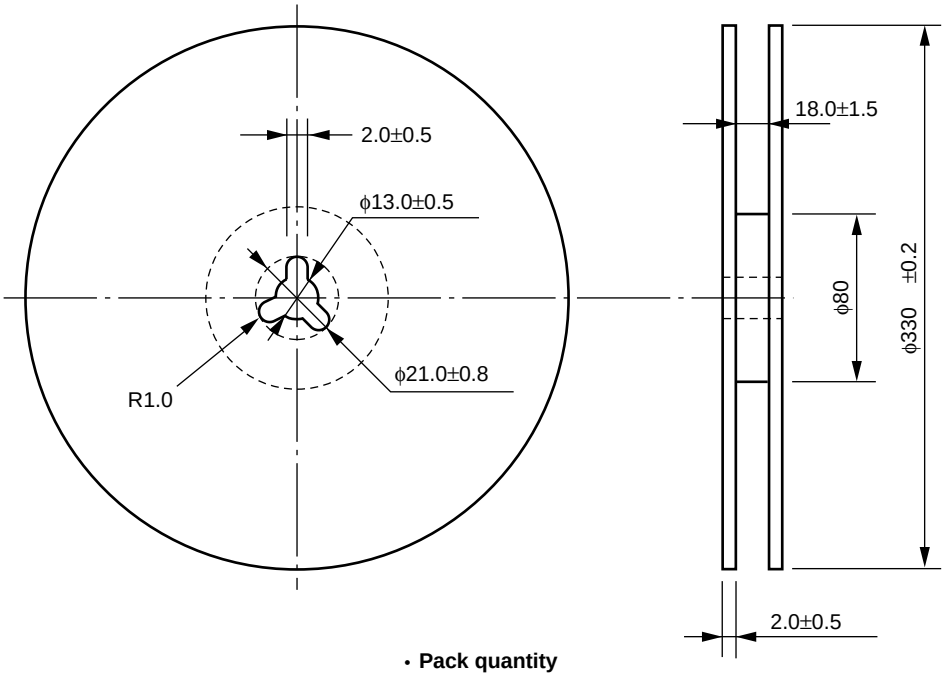
Size	L	L_1	W	W_1
P	10.0	9.4	4.5	3.3
Q	8.0	7.4	3.2	2.6

■ 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

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