FUJITSU SEMICONDUCTOR
DATA SHEET

DS07-10203-1E

Resonator

Piezoelectric Resonator (4 to 23.9 MHz)

FAR Family (C4 series N type)

PRELIMINARY

■ DESCRIPTION

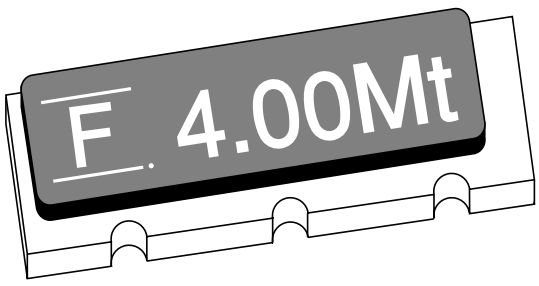
Fujitsu resonators C4 series (N type) feature originally developed single crystals with a high electro-mechanical coefficient ($LiNbO_3$: lithium niobate), the result is very compact packaging.

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).

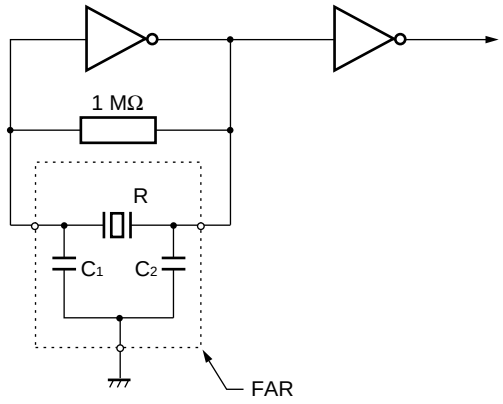
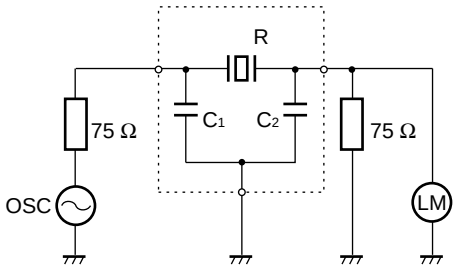
■ FEATURES

- 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



■ STANDARD CHARACTERISTICS

Parameter \ Series	C4 series (N type)		Remarks
Material	Lithium Niobate ($LiNbO_3$)		
Frequency	4 to 17 MHz	17.1 to 23.9 MHz	
Standard frequency	See "■ Standard Frequency."		
Initial frequency deviation	±0.3% (K) ±0.5% (M) ±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	• Resonant frequency  Less than 4 MHz to 10 MHz IC: 1/6MB84069B×2 10 MHz to 20.0 MHz IC: 1/6MC74HC04×2 20.1 MHz to 23.9 MHz IC: 1/6MC74HCU04×2 • 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 4,194 4,915	N	300 Ω max. (Symbol: 0)
6,000 6,144 7,373 8,000 8,388 9,830 10,000 11,059 12,000 12,288 14,746 16,000 16,934 19,661 20,000	N	75 Ω max. (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 Ω max. (Symbol: 0)
6.00 to 23.99 MHz	75 Ω 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.

■ PART NUMBERING SYSTEM

FAR — C4 C N — □□□□□ — □ □ □ — □
(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 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.

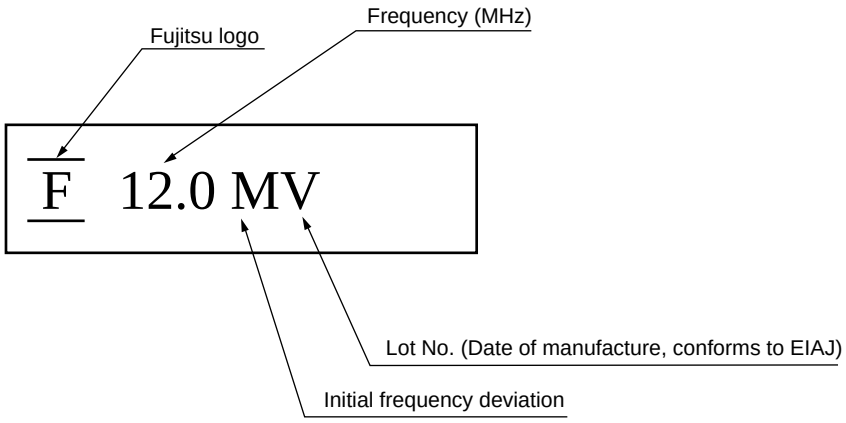
(8) User-specific Special Symbols

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

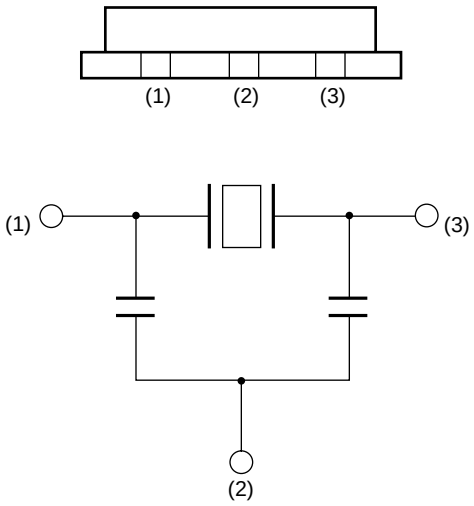
■ MARKING



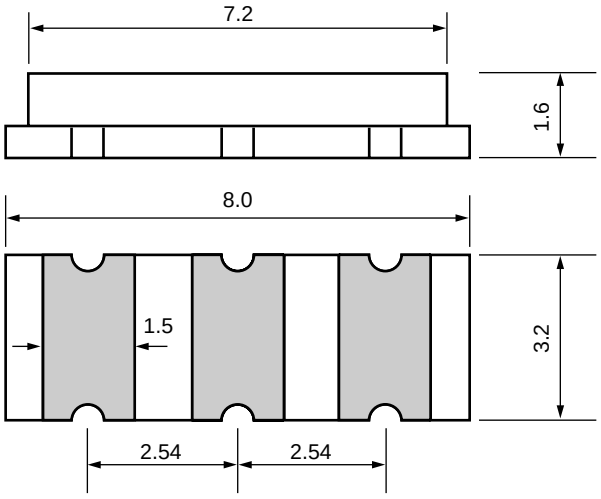
Note: The marking color varies with the capacitance of the built-in capacitator.

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

■ PIN ASSIGNMENT

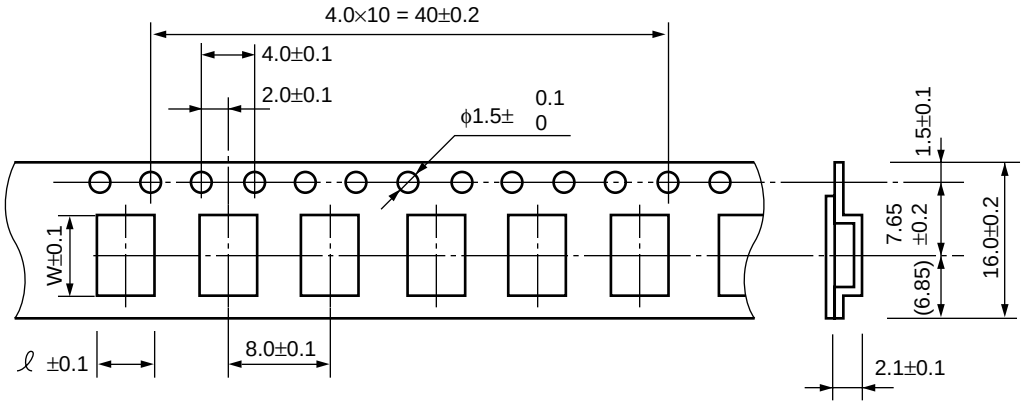


■ DIMENSIONS



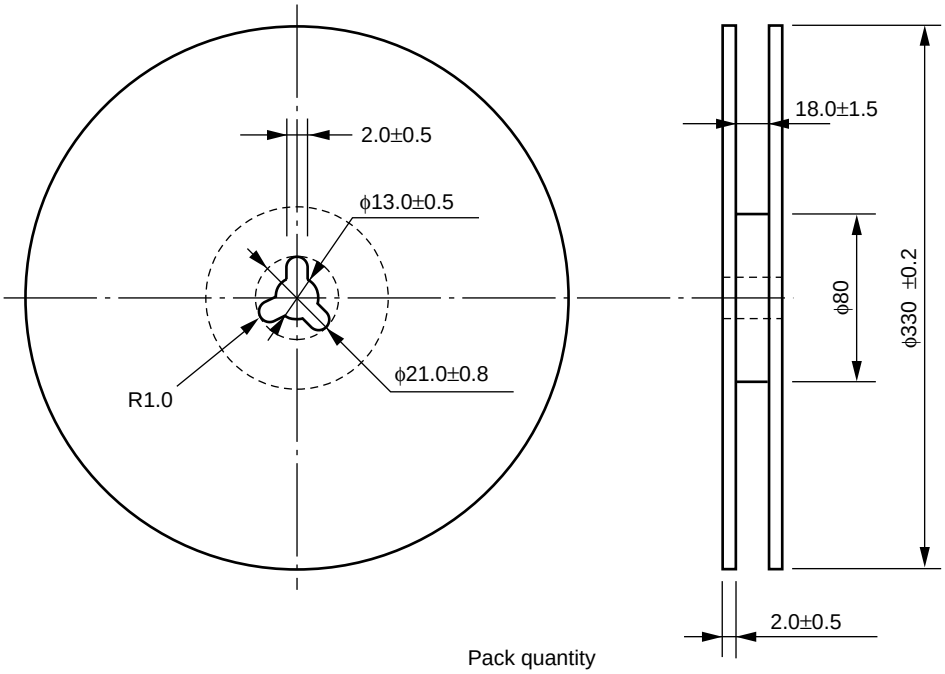
Unit: mm

■ TAPING FORM AND DIMENSIONS



ℓ	W
3.7	8.5

Reel form



Pack quantity

Quantity
3,000

Unit: mm

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