



### ◆ FEATURES

- 2012 size, 32.768 kHz tuning fork crystal unit with 3 options;
  - TFX-03: Standard type** (2.0 × 1.2 × 0.6 mm Max. / 5.0 mg)
  - TFX-03C: Low-ESR type** (2.0 × 1.2 × 0.6 mm Max. / 5.0 mg)
  - TFX-03L: Low-profile type** (2.0 × 1.2 × 0.35 mm Max. / 3.1 mg)
- Ultra-Low ESR in ultra-compact package
- Excellent shock-resistance
- High-precision frequency (available from ±10 ppm @25°C)
- Wide operating temperature range (-40 ~ +105°C)
- High-reliable ceramic/metal package sealed with electron beam
- Specifications in conformity with AEC-Q200 available on request

### ◆ APPLICATIONS

- Smartphones / wireless-modules / wearable devices
- Smart cards (especially for TFX-03L: low-profile type)
- Applications that require accurate clock sources

### ◆ STANDARD SPECIFICATIONS / ORDERING INFORMATION

**Ordering Number (Sample):** F3A — 32768 — 090 — D 90 — R — H X ##

(1)                      (2)                      (3)                      (4) (5)                      (6)                      (7) (8) (9)

(1) Type	
TFX-03	<b>F3A</b>
TFX-03C	<b>F3C</b>
TFX-03L	<b>F3L</b>

(2) Nominal Frequency	
32.768 kHz	<b>32768</b>

(3) Load Capacitance	
5.0, 7.0, 9.0, 12.5 pF*1	e.g. 9.0 pF = <b>090</b>

\*1 Other values available on request

(4) Frequency Tolerance @ 25°C	
±10 ppm	<b>B</b>
±20 ppm	<b>D</b>
±30 ppm	<b>E</b>
±50 ppm	<b>F</b>
Other	<b>N</b>

(5) Equivalent Series Resistance (Motional/Shunt Capacitance)		
TFX-03	90 kΩ Max. (6.5 fF Typ./1.3 pF Typ.)	<b>90</b>
TFX-03L	60 kΩ Max. (7.5 fF Typ./1.5 pF Typ.)	<b>60</b>
TFX-03C	50 kΩ Max. (9.5 fF Typ./1.8 pF Typ.)	<b>50</b>
ALL(03/C/L)	Other	<b>NN</b>

(6) Operating Temperature	
-20 ~ +70°C	<b>P</b>
-40 ~ +85°C	<b>R</b>
-40 ~ +105°C	<b>S</b>
Other	<b>N</b>

(7) Storage Temperature*2	
-40 ~ +85°C	<b>G</b>
-40 ~ +105°C	<b>H</b>
-55 ~ +125°C	<b>J</b>
Other	<b>N</b>

\*2 Not applicable to packing materials

(8) Tape & Reel (φ180 mm)		
TFX-03/03C	3000 pcs/reel	<b>X</b>
TFX-03L	5000 pcs/reel	<b>W</b>
ALL(03/C/L)	Other	<b>N</b>

**(9) RIVER Use Only (As needed)**

Temperature Coefficient
<b>-0.03 ±0.01ppm/°C<sup>2</sup></b>

Turnover Temperature
<b>25 ±5°C</b>

Drive Level
<b>0.5 μW Max.</b>

- "Ordering Number" codes are indicated in blue, and the corresponding specifications are described in black.
- Not all combinations of options are available as a standard specification.
- For specifications other than those above, please consult our sales or contact us via our website with your requirement.

### ◆ OUTLINE DEMENSIONS

### ◆ LAND PATTERN

Unit: mm

