

kHz Range Crystal unit

FC-12M

SEIKO EPSON CORPORATION

Product name

FC-12M 32.768000 kHz 9.0 +20.0-20.0

Product Number / Ordering code

X1A0000610008xx

Please refer to the 5.Packing information about xx (last 2 digits)

Pb free / Complies with EU RoHS directive

Reference weight Typ. 5 mg

**1. Absolute maximum ratings**

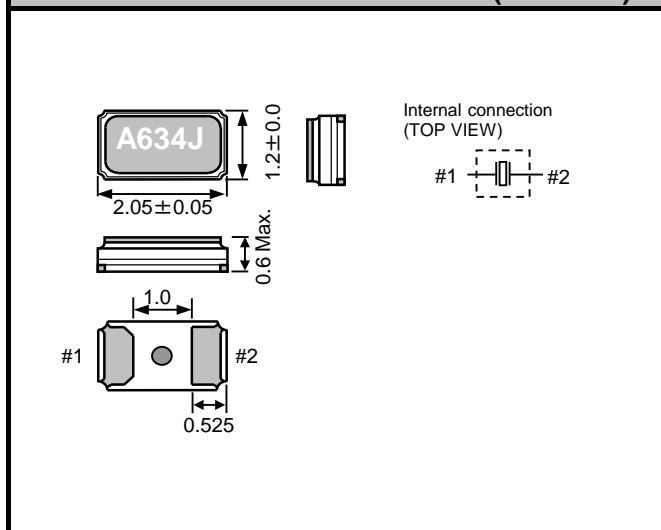
| Parameter           | Symbol | Min. | Typ. | Max. | Unit | Conditions / Remarks      |
|---------------------|--------|------|------|------|------|---------------------------|
| Storage temperature | T_stg  | -55  | -    | +125 | °C   | Storage as single product |
| Maximum drive level | GL     | -    | -    | 0.5  | μW   |                           |

**2. Specificatoin(s)(characteristics)**

| Parameter                 | Symbol | Min.  | Typ.   | Max.  | Unit                                | Conditions / Remarks |
|---------------------------|--------|-------|--------|-------|-------------------------------------|----------------------|
| Nominal frequency         | f_nom  | -     | 32.768 | -     | kHz                                 |                      |
| Operating temperature     | T_use  | -40   | -      | +85   | °C                                  |                      |
| Level of drive            | DL     | -     | -      | 0.5   | μW                                  |                      |
| Frequency tolerance       | f_tol  | -20.0 | -      | +20.0 | $\times 10^{-6}$                    | +25°C DL=0.1μW       |
| Turnover temperature      | Ti     | +20   | +25    | +30   | °C                                  |                      |
| Parabolic coefficient     | B      | -     | -      | -0.04 | $\times 10^{-6}/^{\circ}\text{C}^2$ |                      |
| Load capacitance          | CL     | -     | 9.0    | -     | pF                                  |                      |
| Motional resistance (ESR) | R1     | -     | 65     | 90    | k Ω                                 |                      |
| Motional capacitance      | C1     | -     | 6.4    | -     | fF                                  |                      |
| Shunt capacitance         | C0     | -     | 1.3    | -     | pF                                  |                      |
| Motional inductance       | L1     | -     | 3.7    | -     | kH                                  |                      |
| Frequency aging           | f_age  | -3    | -      | +3.0  | $\times 10^{-6} / \text{yea}$       | @+25°C, First year   |

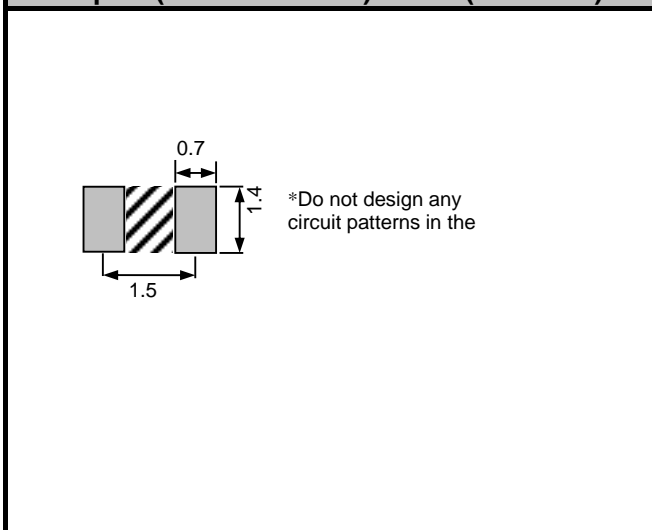
**3. External dimensions**

(Unit: mm)



**4. Footprint(Recommended)**

(Unit: mm)



**5. Packing information**

[ 1 ] Product number last 2 digits code (xx) description

The recommended code is "18"

X1A0000610008xx

| Code | Condition                    | Code | Condition      |
|------|------------------------------|------|----------------|
| 01   | Any Q'ty vinyl bag(Tape cut) | 00   | 3000pcs / Reel |
| 11   | Any Q'ty / Reel              | 18   | 5000pcs / Reel |
| 12   | 250pcs / Reel                |      |                |
| 14   | 1000pcs / Reel               |      |                |

[ 2 ] Taping specification

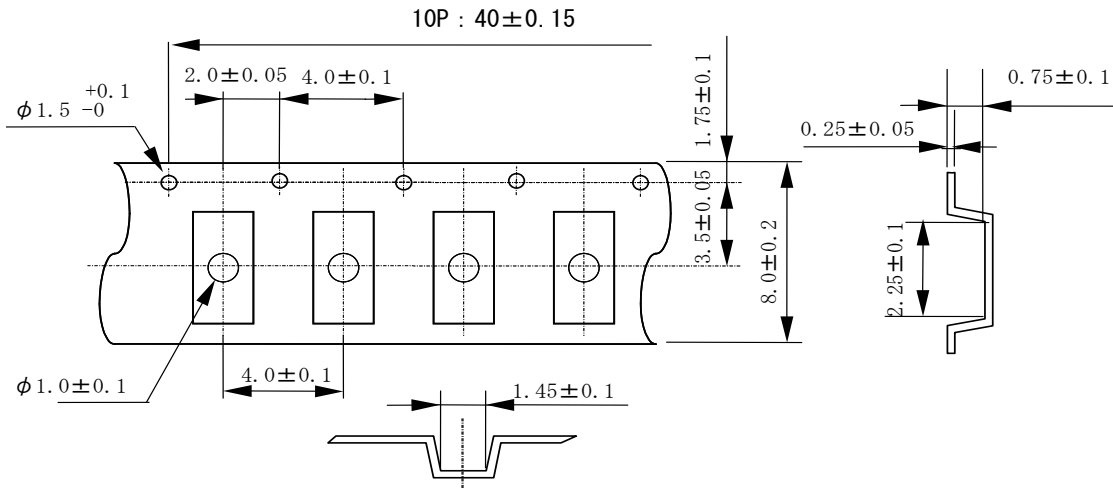
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE0804L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

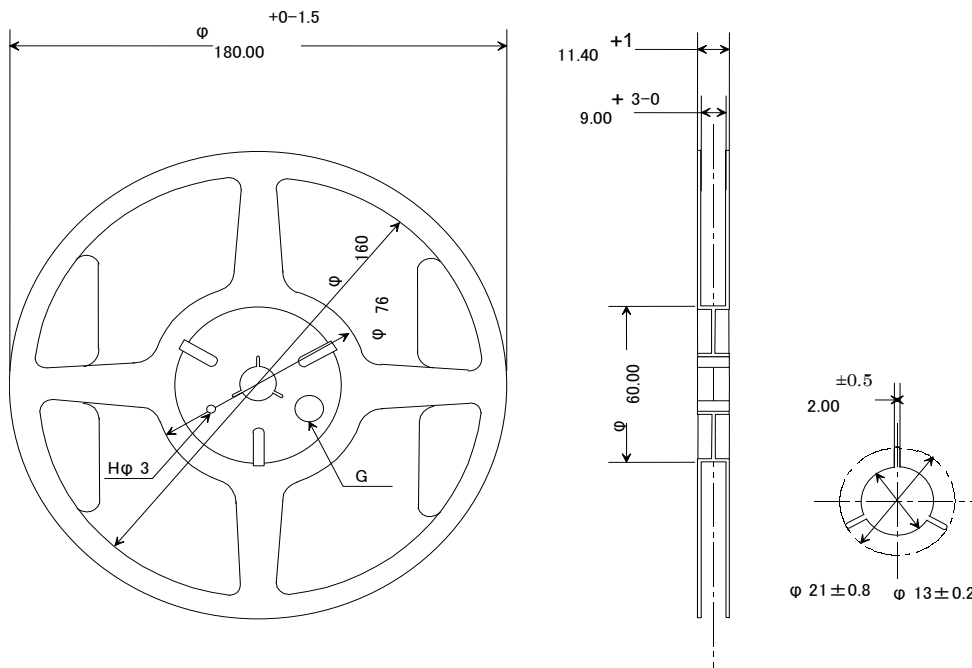
Unit: mm



(2) Reel dimensions

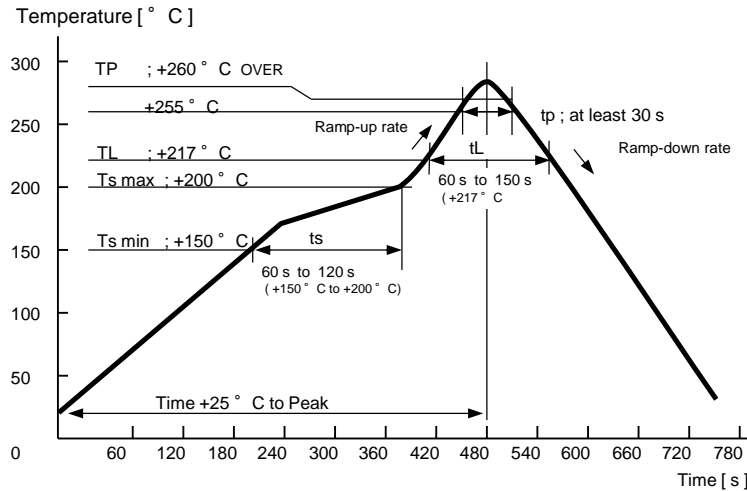
Material of the Reel : PS

Unit: mm



**Reflow profile**

Reflow condition (Follow of JEDEC STD-020D.01)

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