kHz Range Crystal unit FC-12M **SEIKO EPSON CORPORATION**

Product name FC-12M 32.768000 kHz 6.0 +20.0-20.0
Product Number / Ordering code X1A0000610021xx
Please refer to the 5.Packing information about xx (last 2 digits)

Pb free / Complies with EU RoHS directive
Reference weight Typ. 5 mg

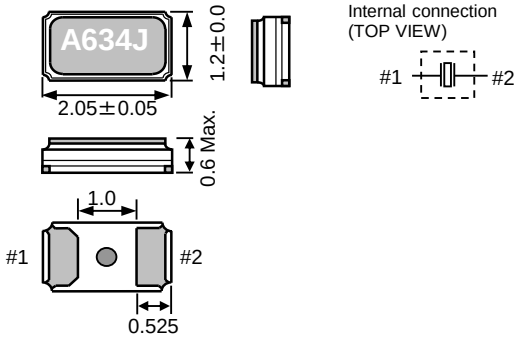
**1.Absolute maximum ratings**

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

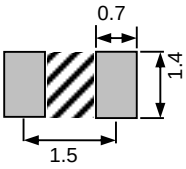
**2.Specificatoins(characteristics)**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions / Remarks |
|---|---|---|---|---|---|---|
| Nominal frequency | f_nom | - | 32.768 | - | kHz | |
| Operating temperature | T_use | -40 | - | 85 | ºC | |
| Level of drive | DL | - | - | 0.5 | µW | |
| Frequency tolerance | f_tol | -20.0 | - | +20.0 | x $10^{-6}$ | +25ºC DL=0.1µW |
| Turnover temperature | Ti | 20 | 25 | 30 | ºC | |
| Parabolic coefficient | B | - | - | -0.04 | x $10^{-6}$/ºC$^2$ | |
| Load capacitance | CL | - | 6.0 | - | 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 | x$10^{-6}$ /yea | @+25ºC, First year |

**3.External dimensions (Unit: mm)**




**4.Footprint(Recommended) (Unit: mm)**




*Do not design any circuit patterns in the

**5.Packing information**

[ 1 ]Product number last 2 digits code (xx) description The recommended code is "18"

X1A0000610021xx

| 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

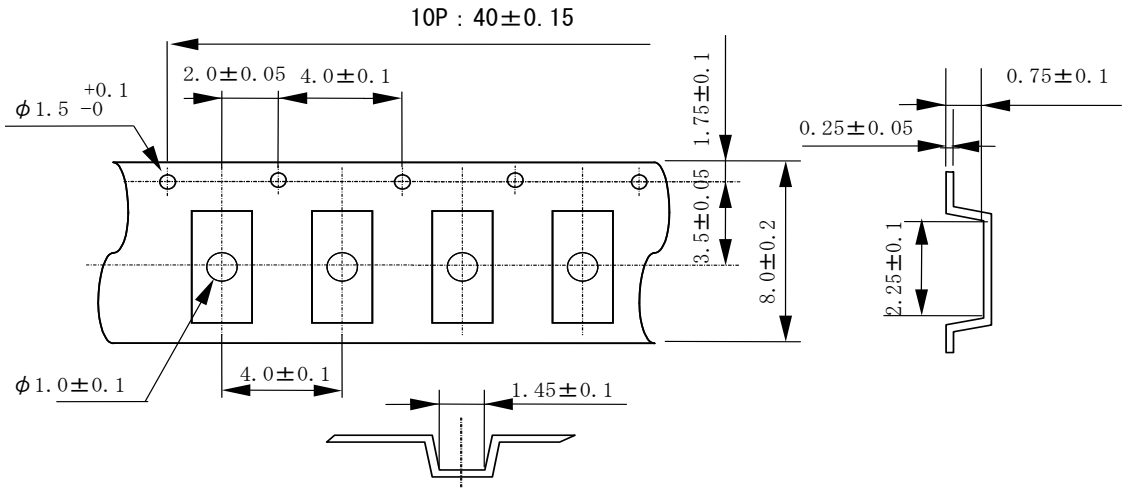
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE0804L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

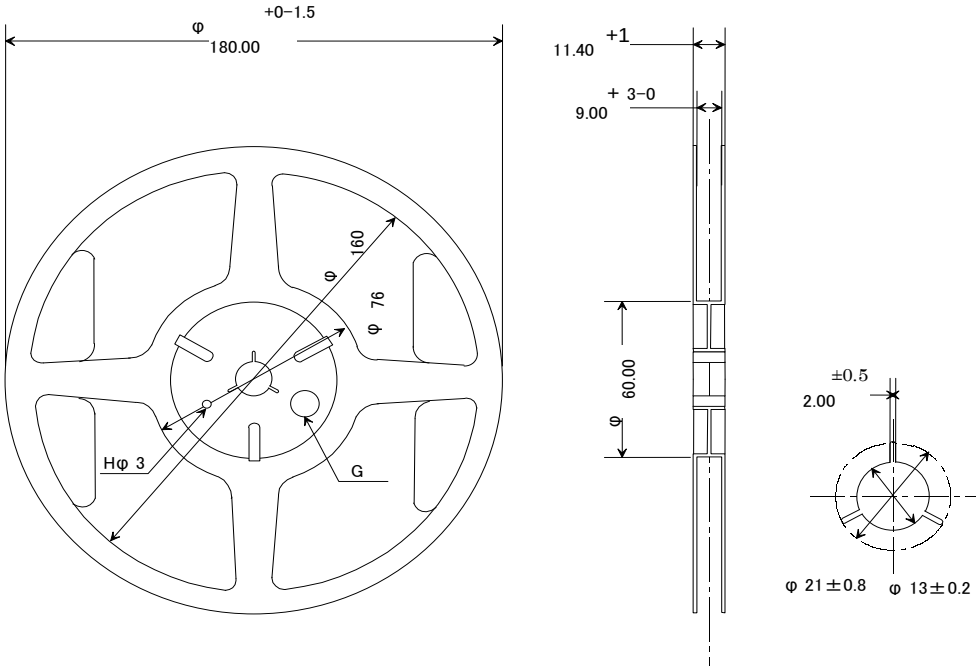
Unit: mm




(2) Reel dimensions

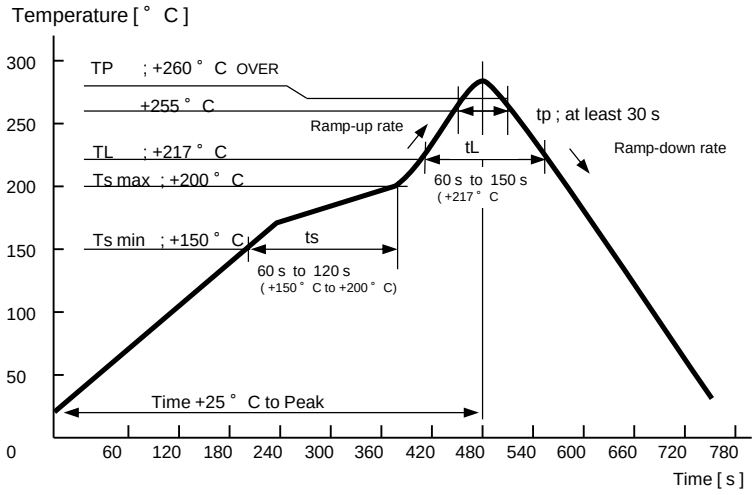
Material of the Reel : PS

Unit: mm



## Reflow profile

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




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