MHz Range Crystal unit FA-238A

SEIKO EPSON CORPORATION

Product name FA-238A 12.000000 MHz 13.0 +30.0-30.0 AEC-Q200 compliant

Product Number / Ordering code X1E0003410371xx

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

Pb free / Complies with EU RoHS directive

Reference weight Typ. 16 mg

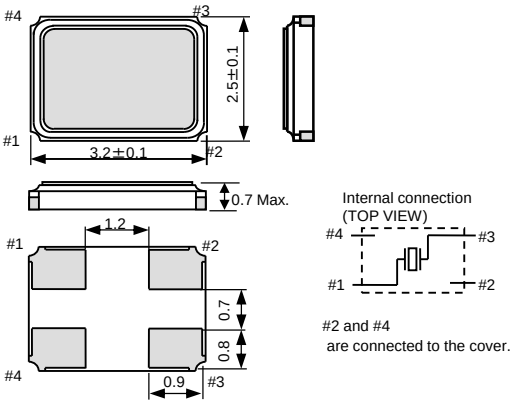
## 1.Absolute maximum ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions / Remarks |
|---|---|---|---|---|---|---|
| Storage temperature | T_stg | -40 | - | +125 | ºC | Storage as single product |
| Operating temperature | T_use | -40 | - | +125 | ºC | |

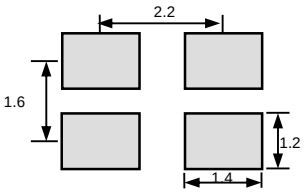
## 2.Specifications(characteristics)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions / Remarks |
|---|---|---|---|---|---|---|
| Nominal frequency | f_nom | - | 12.000000 | - | MHz | Fundamental |
| Frequency tolerance | f_tol | -30 | - | +30 | x $10^{-6}$ | @+25ºC |
| Frequency Stability over temperature | f_tem | -50 | - | +50 | x $10^{-6}$ | -40ºC to +105ºC |
| Operating temperature | T_use | -40 | - | +105 | ºC | |
| Level of drive | DL | 1 | 100 | 200 | µW | |
| Load capacitance | CL | - | 13 | - | pF | |
| Motional resistance (ESR) | R1 | - | - | 120 | Ω | |
| Motional capacitance | C1 | - | 1.94 | - | fF | |
| Motional inductance | L1 | - | 90.80 | - | mH | |
| Shunt capacitance | C0 | - | 0.92 | - | pF | |
| Frequency aging | f_age | -5 | - | +5 | x$10^{-6}$ /yea | @+25ºC, 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 "17"

X1E0003410371xx

| Code | Condition | Code | Condition |
|---|---|---|---|
| 01 | Any Q'ty vinyl bag(Tape cut) | 14 | 1000pcs / Reel |
| 11 | Any Q'ty / Reel | 15 | 2000pcs / Reel |
| 12 | 250pcs / Reel | 00 | 3000pcs / Reel |
| 13 | 500pcs / Reel | 17 | 4000pcs / Reel |

[ 2 ] Taping specification

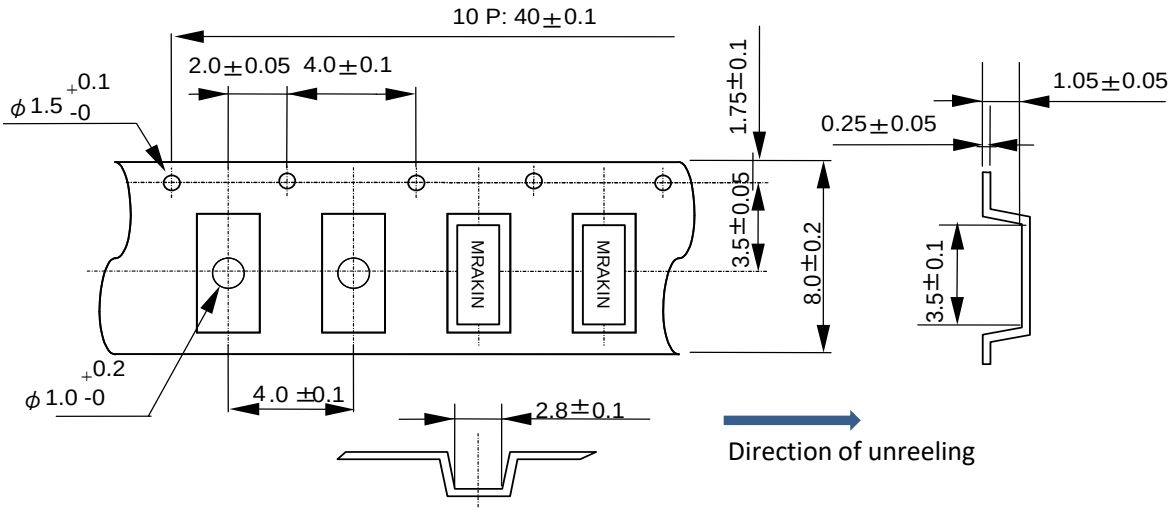
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE0804L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

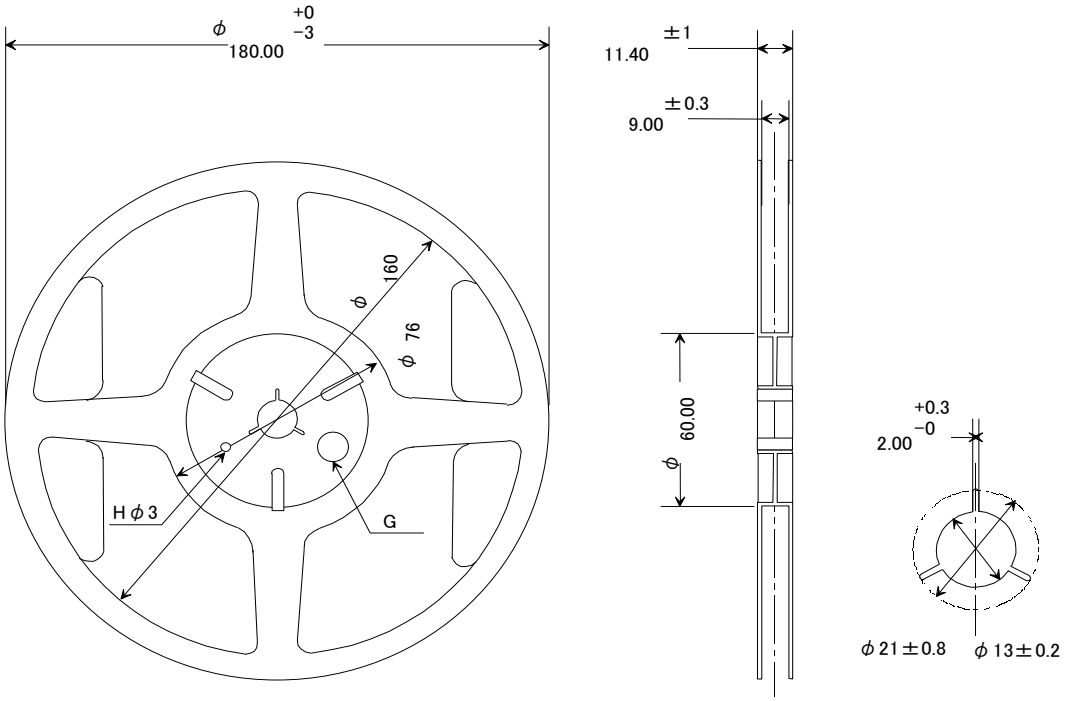



(2) Reel dimensions

Center material : PS

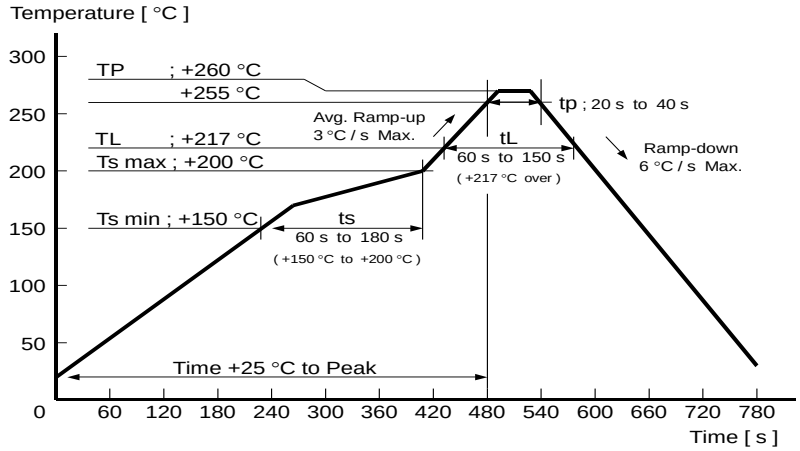
Material of the Reel : PS

Unit: mm



## 6.Reflow profile

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




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