

MHz Range Crystal unit                      FA-238V

SEIKO EPSON CORPORATION

Product name            FA-238V    12.000000 MHz 12.0 +50.0-50.0 (Custom products for IC reference)

Product Number / Ordering code            Q22FA23V00007xx

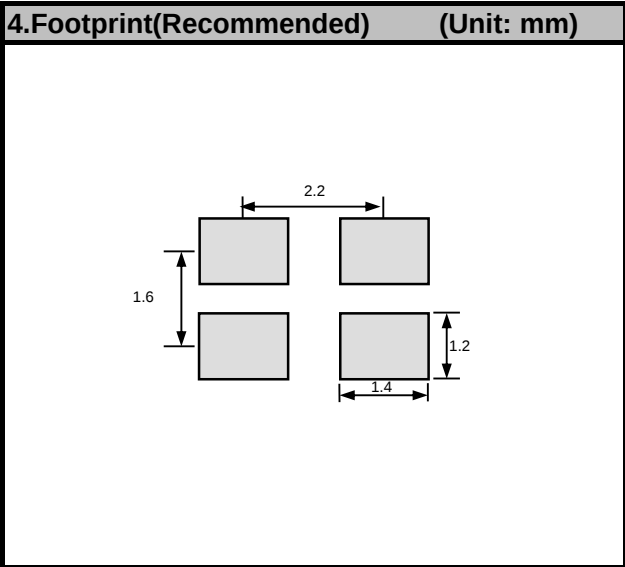
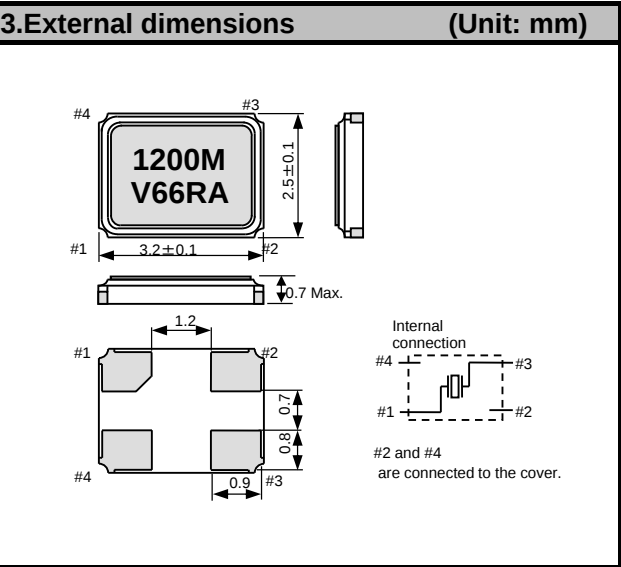
Please refer to the 5.Packing information about xx (last 2 digits)

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 | °C   | Storage as single product |
| Operating temperature      | T_use  | -40  | -    | +105 | °C   |                           |

| 2.Specifications(characteristics)    |        |      |           |      |                        |                      |
|--------------------------------------|--------|------|-----------|------|------------------------|----------------------|
| Parameter                            | Symbol | Min. | Typ.      | Max. | Unit                   | Conditions / Remarks |
| Nominal frequency                    | f_nom  | —    | 12.000000 | —    | MHz                    | Fundamental          |
| Frequency tolerance                  | f_tol  | -50  | -         | +50  | x 10 <sup>-6</sup>     | @+25°C               |
| Frequency Stability over temperature | f_tem  | -30  | -         | +30  | x 10 <sup>-6</sup>     | -20°C to 70°C        |
| Operating temperature                | T_use  | -20  | -         | +70  | °C                     |                      |
| Level of drive                       | DL     | 10   | 100       | 200  | μW                     |                      |
| Load capacitance                     | CL     | —    | 12        | —    | pF                     |                      |
| Motional resistance (ESR)            | R1     | -    | -         | 100  | Ω                      |                      |
| Motional capacitance                 | C1     | -    | 2.01      | -    | fF                     |                      |
| Motional inductance                  | L1     | -    | 87.68     | -    | mH                     |                      |
| Shunt capacitance                    | C0     | -    | 0.96      | -    | pF                     |                      |
| Frequency aging                      | f_age  | -5   | —         | +5   | x10 <sup>-6</sup> /yea | @+25°C, First year   |



5.Packing information

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

The recommended code is "17"

Q22FA23V00007xx

| 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

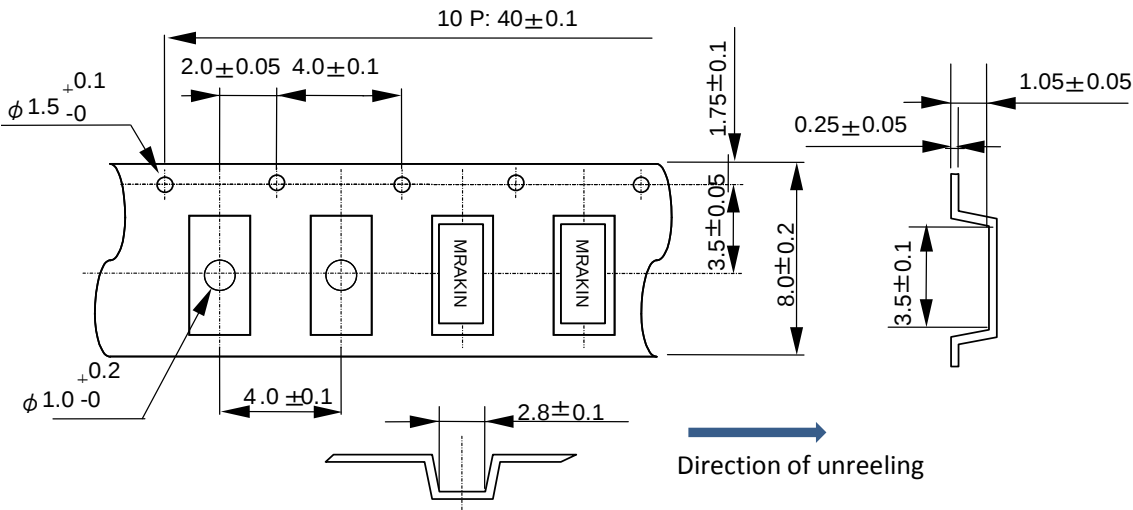
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE0804L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

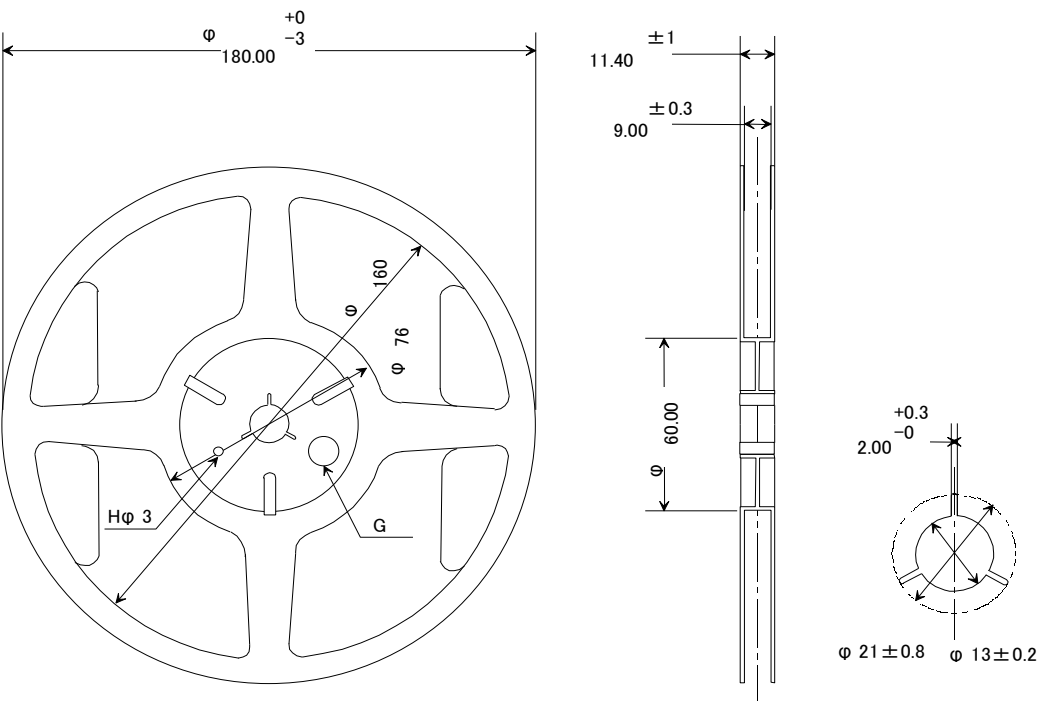


(2) Reel dimensions

Center material : PS

Material of the Reel : PS

Unit: mm



## 6.Reflow profile

### Reflow condition

Pre Heating Temperature

Tp1 ~ Tp2 = + 170 ° C

Heating Temperature

TMit = + 220 ° C

Peak Temperature

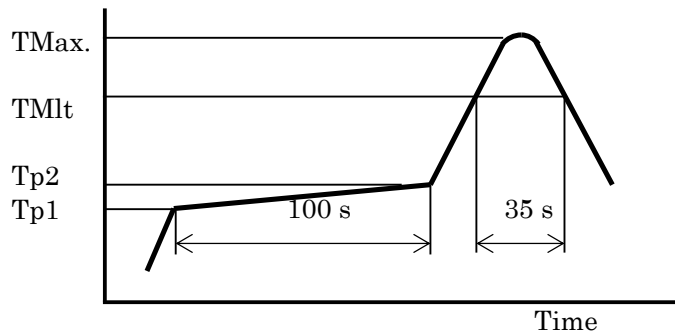
TMax. = + 260 ° C

Point of measuring

In case of Solderability  
Terminal.

In case of Resistance to soldering heat  
Surface.

Temperature



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