

Product name FA-238 20.000000 MHz 7.0 +15.0-15.0

Product Number / Ordering code Q22FA23801434xx

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  | —    | 20.000000 | —    | MHz                    | Fundamental          |
| Frequency tolerance                  | f_tol  | -15  | -         | +15  | x 10 <sup>-6</sup>     | @+25°C               |
| Frequency Stability over temperature | f_tem  | -15  | -         | +15  | 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     | —    | 7         | —    | pF                     |                      |
| Motional resistance (ESR)            | R1     | -    | -         | 60   | Ω                      |                      |
| Motional capacitance                 | C1     | -    | 2.56      | -    | fF                     |                      |
| Motional inductance                  | L1     | -    | 24.76     | -    | mH                     |                      |
| Shunt capacitance                    | C0     | -    | 0.98      | -    | pF                     |                      |
| Frequency aging                      | f_age  | -5   | —         | +5   | x10 <sup>-6</sup> /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 "17"

Q22FA23801434xx

| 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

$T_{p1} \sim T_{p2} = +170^{\circ}\text{C}$

Heating Temperature

$T_{Mlt} = +220^{\circ}\text{C}$

Peek Temperature

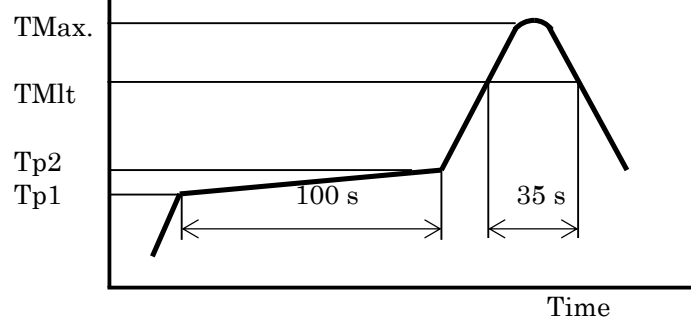
$T_{Max.} = +260^{\circ}\text{C}$

Point of measuring

In case of Solderability  
Terminal.

In case of Resistance to soldering heat  
Surface.

Temperature



## 7. Notice

- This material is subject to change without notice.
- Any part of this material may not be reproduced or duplicated in any form or any means without the written permission of Seiko Epson.
- The information about applied data, circuitry, software, usage, etc. written in this material is intended for reference only.  
Seiko Epson does not assume any liability for the occurrence of customer damage or infringing on any patent or copyright of a third party.  
This material does not authorize the licensing for any patent or intellectual copyrights.
- When exporting the products or technology described in this material, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
- You are requested not to use the products (and any technical information furnished, if any) for the development and/or manufacture of weapon of mass destruction or for other military purposes. You are also requested that you would not make the products available to any third party who may use the products for such prohibited purposes.
- These products are intended for general use in electronic equipment. When using them in specific applications that require extremely high reliability, such as the applications stated below, you must obtain permission from Seiko Epson in advance.
  - / Space equipment (artificial satellites, rockets, etc.)
  - / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.)
  - / Medical instruments to sustain life
  - / Submarine transmitters
  - / Power stations and related
  - / Fire work equipment and security equipment
  - / Traffic control equipment
  - / And others requiring equivalent reliability.
- All brands or product names mentioned herein are trademarks and/or registered trademarks of their respective.

## Contact us

<http://www5.epsondevice.com/en/contact/>