

kHz Range Crystal unit

MC-146

SEIKO EPSON CORPORATION

Product name

MC-146 32.768000 kHz 6.0 +20.0-20.0

Product Number / Ordering code

Q13MC14620006xx

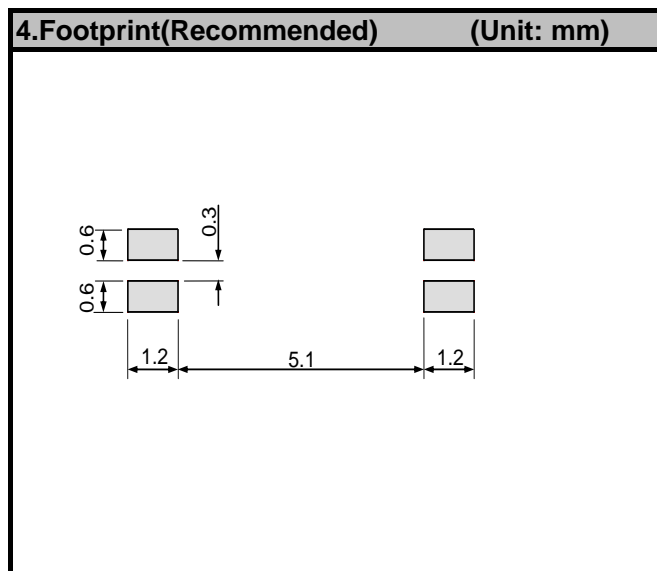
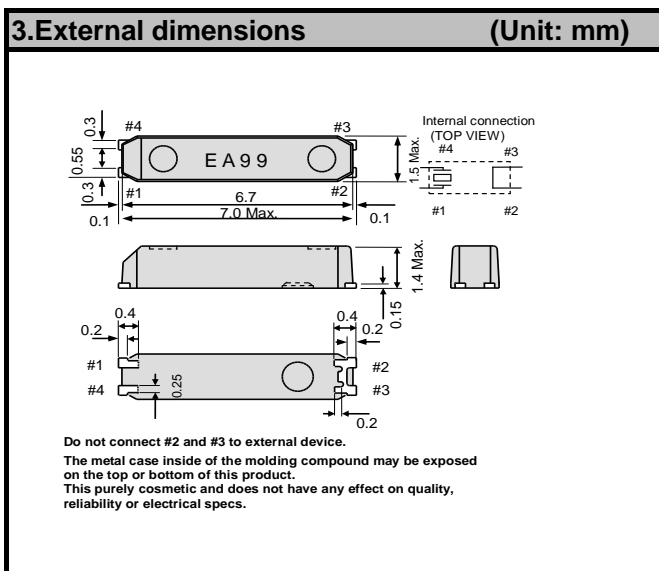
Please refer to the 5.Packing information about xx (last 2 digits)

Complies with EU RoHS directive

Reference weight Typ. 29 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 | - | - | 1.0 | μW | |

| 2.Specifications(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 | - | - | 1.0 | μW | |
| Frequency tolerance | f_tol | -20.0 | - | +20.0 | x 10 ⁻⁶ | +25°C DL=0.1μW |
| Turnover temperature | Ti | 20 | 25 | 30 | °C | |
| Parabolic coefficient | B | - | - | -0.04 | x 10 ⁻⁶ /°C ² | |
| Load capacitance | CL | - | 6.0 | - | pF | |
| Motional resistance (ESR) | R1 | - | 45 | 65 | k Ω | |
| Motional capacitance | C1 | - | 1.9 | - | fF | |
| Shunt capacitance | C0 | - | 0.8 | - | pF | |
| Motional inductance | L1 | - | 11.7 | - | kH | |
| Frequency aging | f_age | -3 | - | 3 | x10 ⁻⁶ /yea | @+25°C, First year |



5.Packing information

[1] Product number last 2 digits code (xx) description The recommended code is "0X"

Q13MC14620006xx

| 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 | 0X | 9000pcs / Reel |

[2] Taping specification

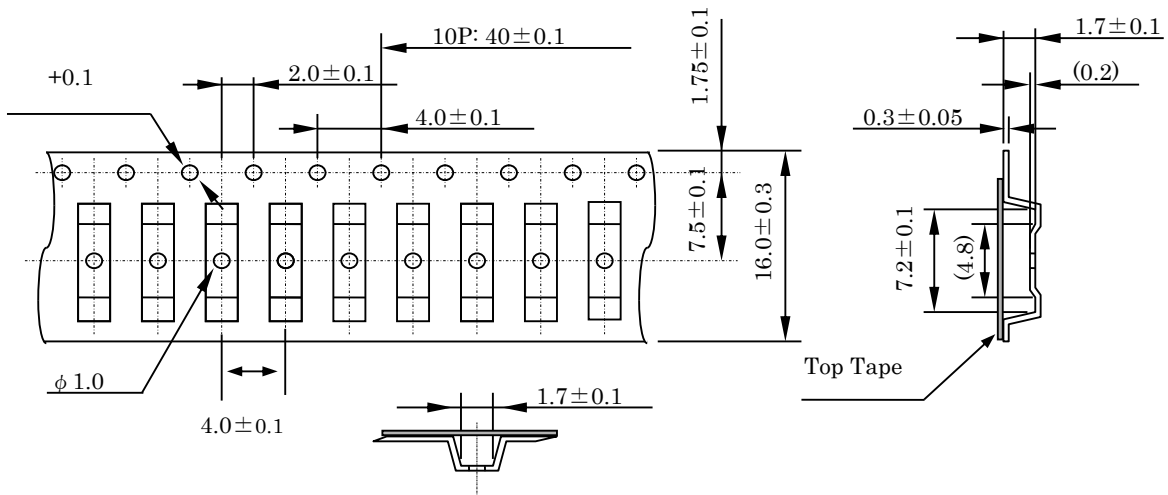
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE1604L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

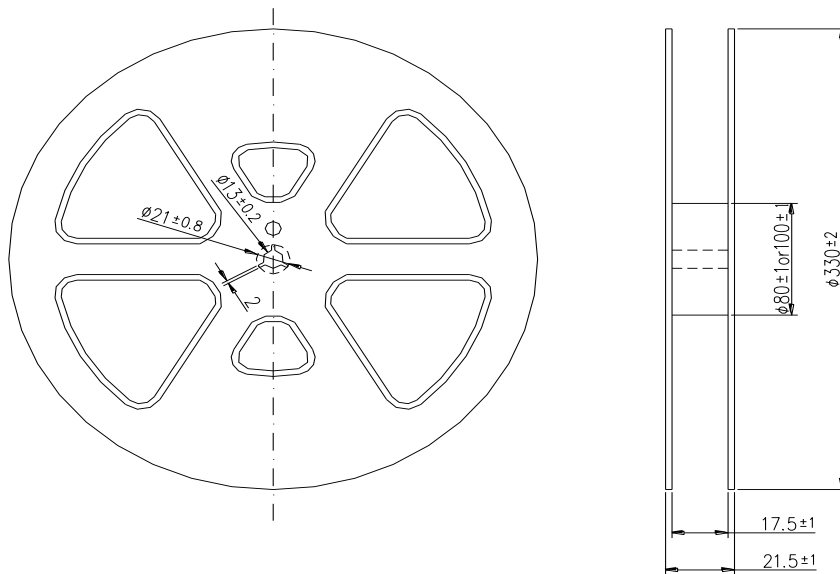
Unit: mm



(2) Reel dimensions

Material of the Reel : PS

Unit: mm



Reflow profile

Pre Heating Temperature

Tp1 ~ Tp2 = + 170 °C

Heating Temperature

TMI = + 220 °C

Peak Temperature

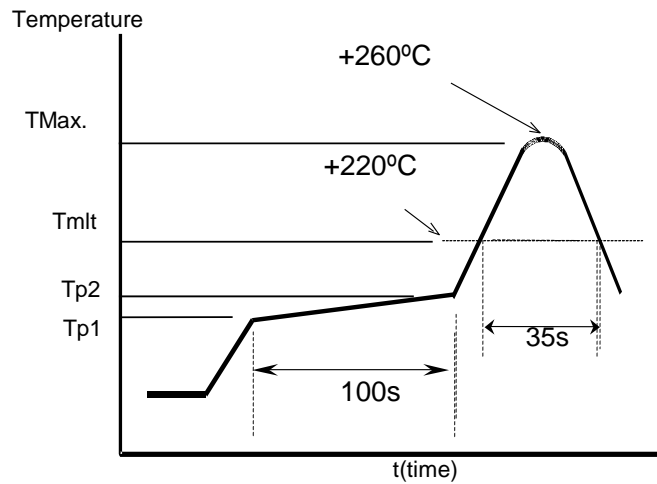
TMax. = + 260 °C

Point of measuring

In case of Solder ability

Terminal.

In case of Resistance to soldering heat
Surface.

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