

kHz Range Crystal unit

FC-135

SEIKO EPSON CORPORATION

Product name

FC-135 32.768000 kHz 9.0 +10.0-10.0

Product Number / Ordering code

Q13FC13500006xx

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

Complies with EU RoHS directive

Reference weight Typ. 11 mg

**1.Absolute maximum ratings**

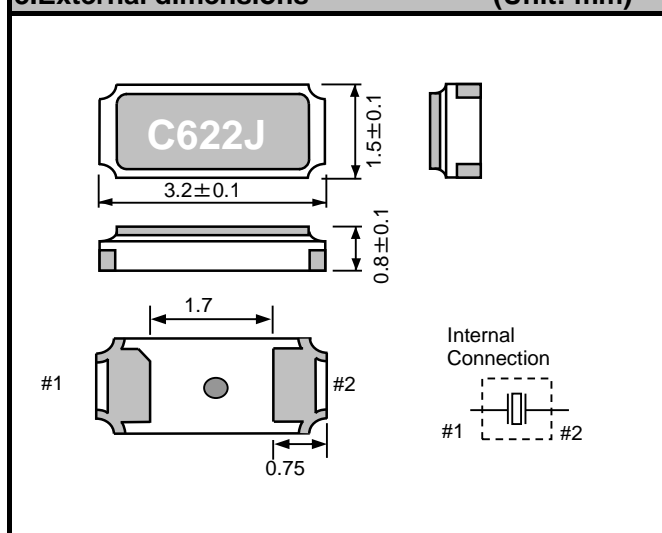
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Storage temperature	T_stg	-55	-	125	°C	Storage as single product
Maximum drive level	GL	-	0.5	-	μW	

**2.Specifications(characteristics)**

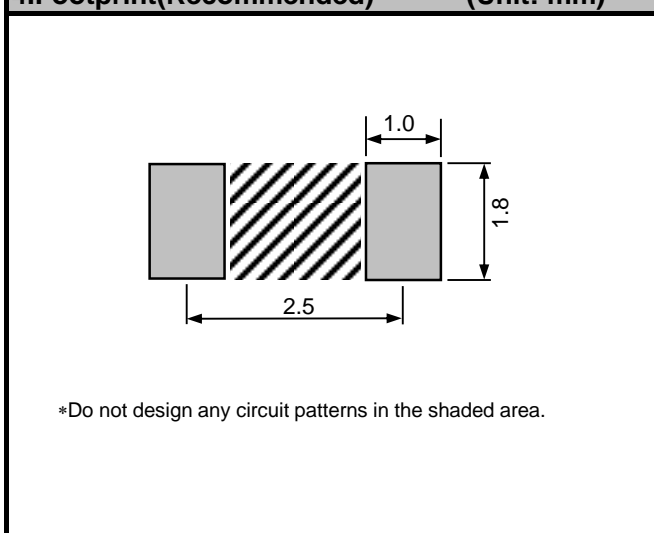
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Nominal frequency	f_nom	-	32.768	-	kHz	
Operating temperature	T_use	-40	-	85	°C	
Level of drive	DL	-	0.1	-	μW	
Frequency tolerance	f_tol	-10.0	-	+10.0	x 10 <sup>-6</sup>	+25°C DL=0.1μW
Turnover temperature	Ti	20	25	30	°C	
Parabolic coefficient	B	-	-	-0.04	x 10 <sup>-6</sup> /°C <sup>2</sup>	
Load capacitance	CL	-	9.0	-	pF	
Motional resistance (ESR)	R1	-	55	70	k Ω	
Motional capacitance	C1	-	3.4	-	fF	
Shunt capacitance	C0	-	1	-	pF	
Motional inductance	L1	-	7.1	-	kH	
Frequency aging	f_age	-3	-	3	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 "00"

Q13FC13500006xx

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		

## [ 2 ] Taping specification

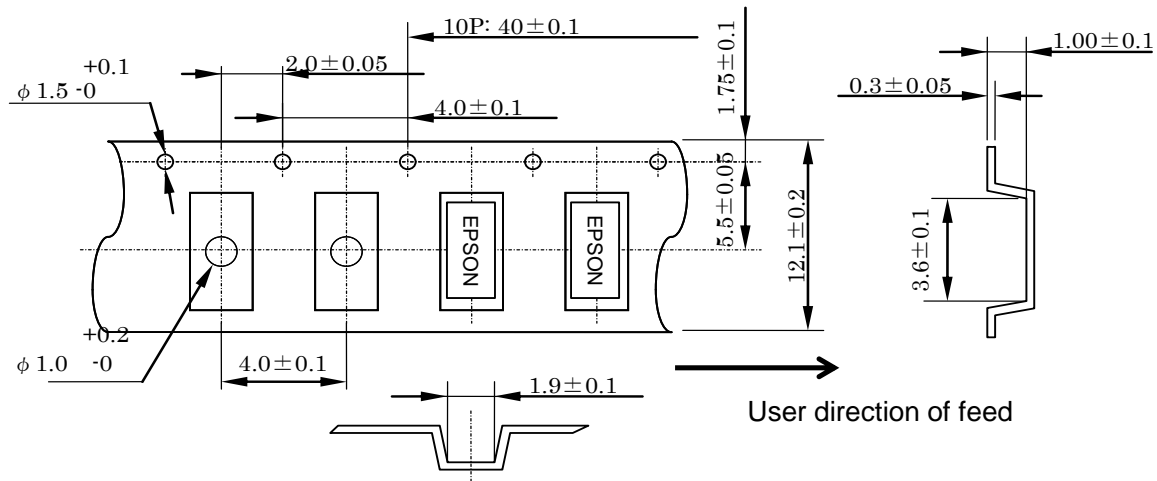
Subject to EIA-481 &amp; IEC-60286

## (1) Tape dimensions TE1204L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

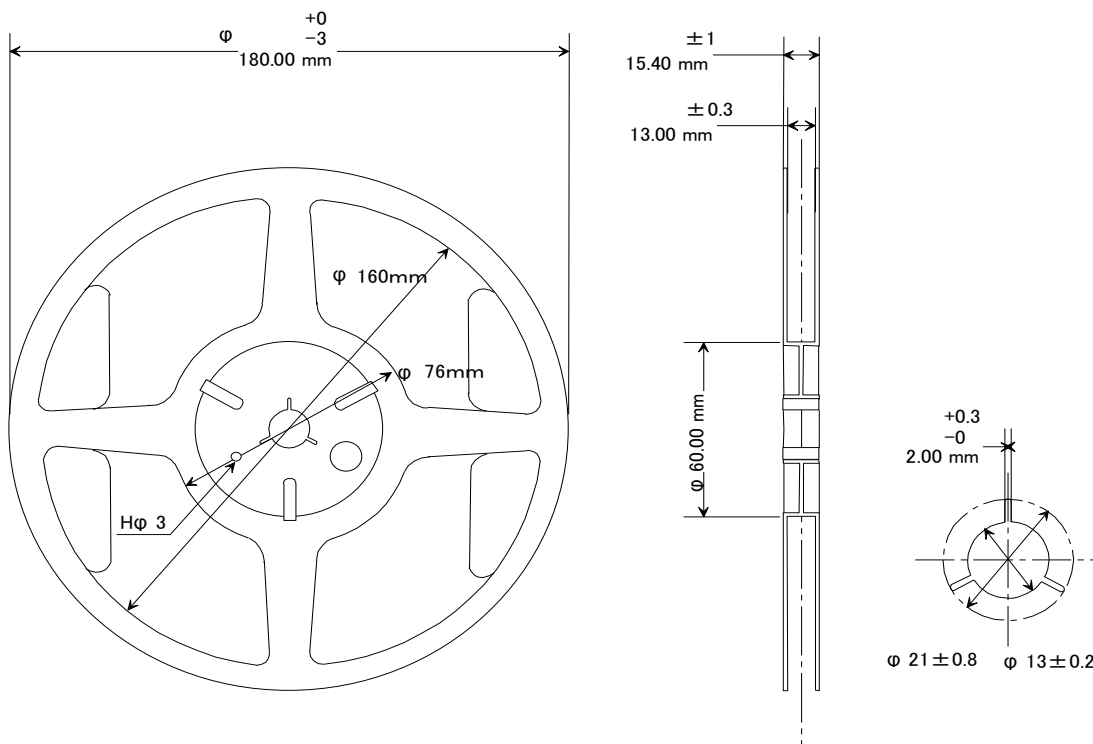
Unit: mm



## (2) Reel dimensions

Material of the Reel : PS

Unit: mm



**Reflow profile**

Pre Heating Temperature

Tp1 ~ Tp2 = + 170 °C

Heating Temperature

T<sub>Mlt</sub> = + 220 °C

Peek Temperature

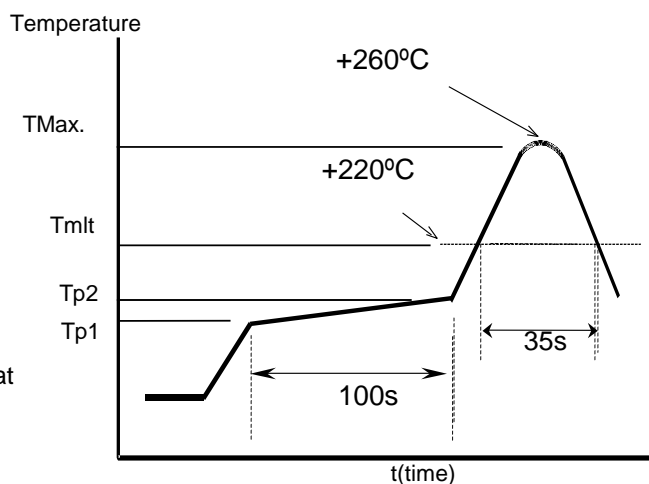
T<sub>Max.</sub> = + 260 °C

Point of measuring

In case of Solder ability

Terminal.

In case of Resistance to soldering heat  
Surface.

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