

kHz Range Crystal unit

FC-135

SEIKO EPSON CORPORATION

Product name

FC-135 32.768000 kHz 6.0 +10.0-10.0

Product Number / Ordering code

Q13FC13500060xx

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

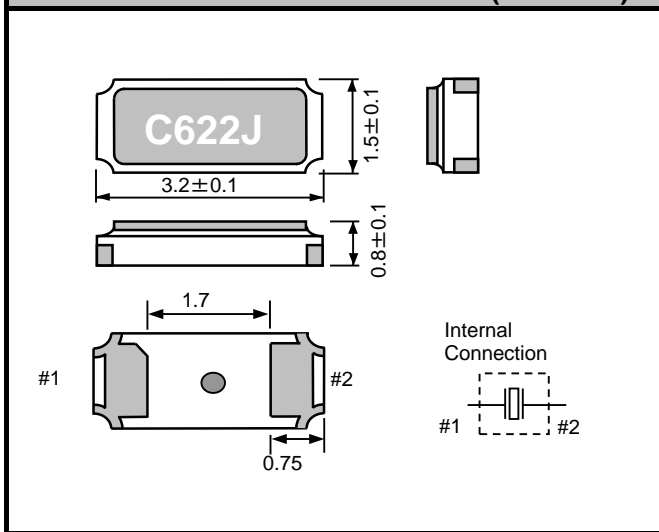
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Storage temperature	T_stg	-55	-	125	°C	Storage as single product
Maximum drive level	GL	-	-	0.5	μW	

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	-	-	0.5	μW	
Frequency tolerance	f_tol	-10	-	10	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	-	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 ⁻⁶ /yea	@+25°C, First year

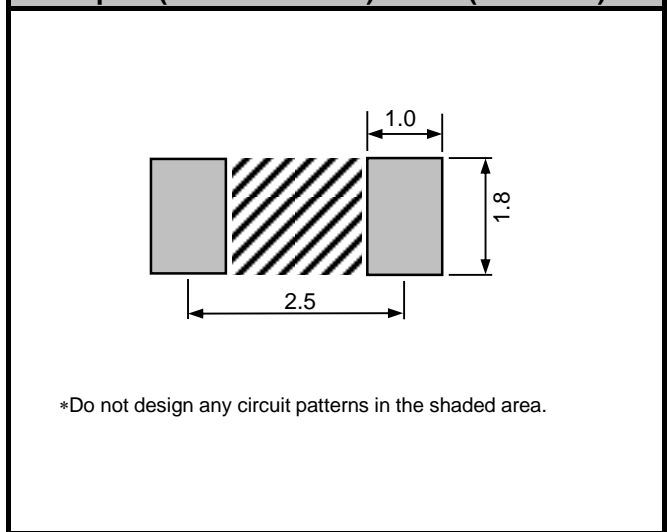
3.External dimensions

(Unit: mm)



4.Footprint(Recommended)

(Unit: mm)



5.Packing information

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

The recommended code is "00"

Q13FC13500060xx

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		

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[2] Taping specification

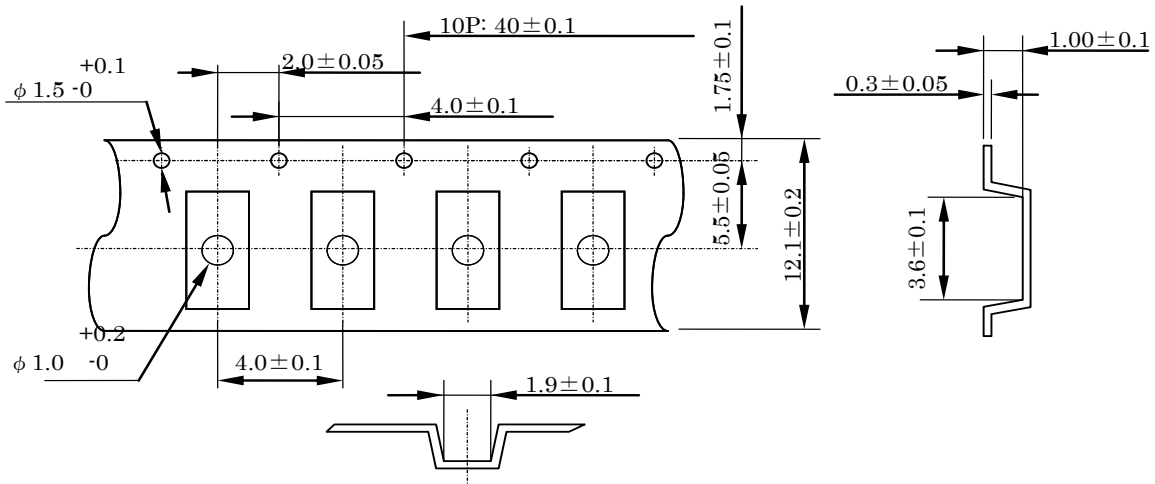
Subject to EIA-481 & IEC-60286

(1) Tape dimensions TE1204L

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

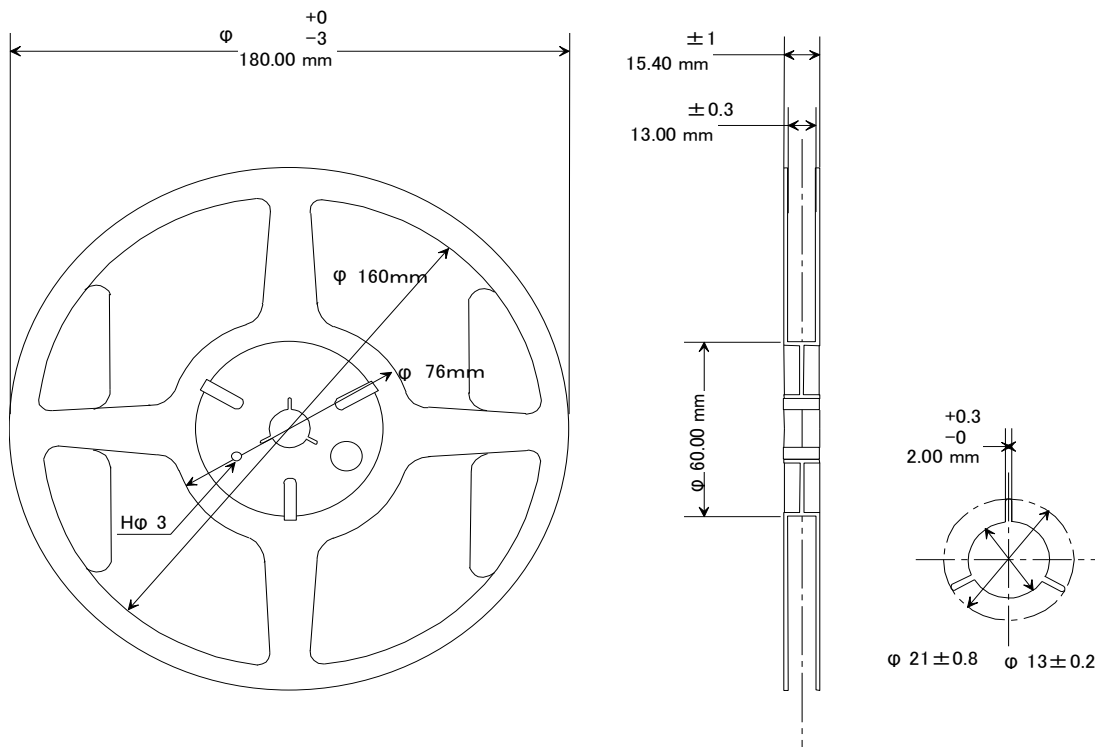
Unit: mm



(2) Reel dimensions

Material of the Reel : PS

Unit: mm



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Reflow profile

Pre Heating Temperature

Tp1 ~ Tp2 = + 170 °C

Heating Temperature

TMI = + 220 °C

Peak Temperature

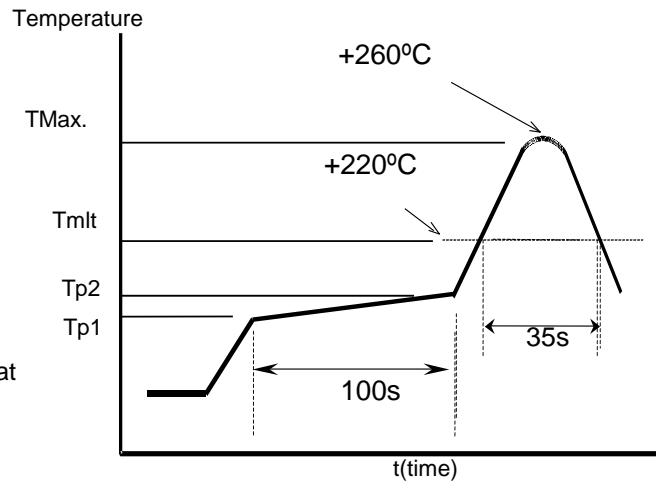
TMax. = + 260 °C

Point of measuring

In case of Solder ability

Terminal.

In case of Resistance to soldering heat
Surface.



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