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SPECIFICATION FOR APPROVAL

CUSTOMER	:	
PRODUCT TYPE	:	SMD TUNING FORK 3.2X1.5
NOMINAL FREQ.	:	32.768KHz
STARWAVE P/N	:	SW321532768KDBVT
REVISION	:	A1
CUSTOMER P/N	:	
PM / SALES	:	
DATE	:	
CUSTOMER CONFIRMATION	:	
		(Singnature)
		(Date)

MSL: Level 1
Halogen Free
RoHS Compliant

PRODUCT SPECIFICATION SHEET

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REVISION : A1

RD	QA	MFG
<i>Zhang fen qi</i>	<i>Xu wen tao</i>	<i>Luo jun jie</i>
<i>14-Jul-26</i>	<i>14-Jul-26</i>	<i>14-Jul-26</i>

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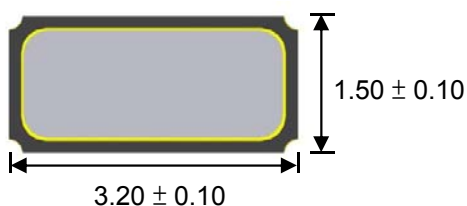
ELECTRICAL SPECIFICATIONS

	Parameters	Sym.	Electrical Spec.				Notes
			Min	Typical	Max	Unit	
1	Nominal Frequency	F0	32.768				KHz
2	Frequency Tolerance	$\Delta f/f_0$	-20		+20	ppm	at 25 °C +/-3 °C
3	Load Capacitance	CL	7				pF
4	Driver Level	DL	-	0.1	0.5	μW	-
5	Equivalent Series Resistance	ESR	-	-	65	KΩ	at 25 °C +/-3 °C
6	Turnover Temperature	Tp	20	25	30	°C	at 25 °C +/-3 °C
7	Parabolic Curvature Constant	K	-	-	-0.04	ppm/°C ²	-
8	Operating Temperature	-	-40	~	85	°C	-
9	Storage Temperature	-	-55	~	125	°C	-
10	Insulation Resistance	IR	500	-	-	MΩ	at DC 100V+/-15V
11	Shunt Capacitance	C0	-	-	1.5	pF	
12	Aging	$\Delta f/f$	-2		+2	ppm	1st Year

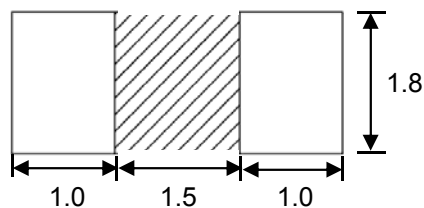
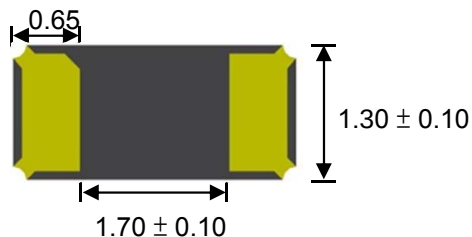
FACTORY LOCATION : CHINA

DIMENSIONS

(UNIT:mm)



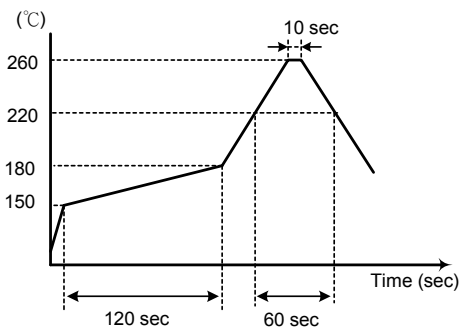
RECOMMENDED SOLDER PAD (UNIT:mm)



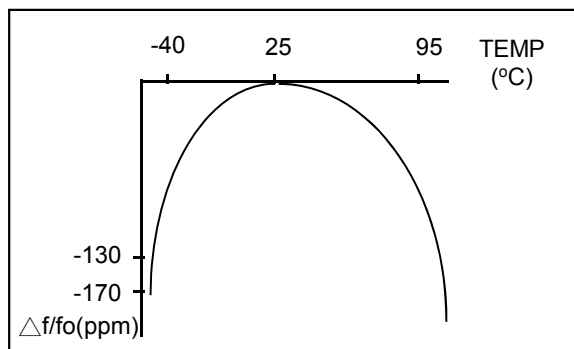
SUGGESTED REFLOW PROFILE

Total time : 200 sec. Max.

Solder melting point :220°C



TEMPERATURE V.S FREQUENCY CURVE



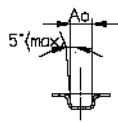
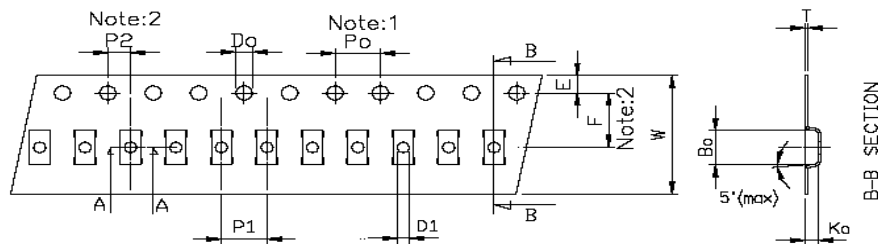
MARKING



Frequency /CL Code

KHz	PF	CODE
32.768	6	D

PACKING

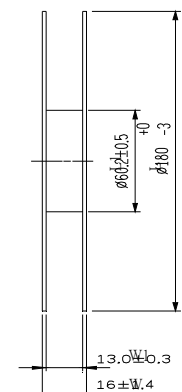
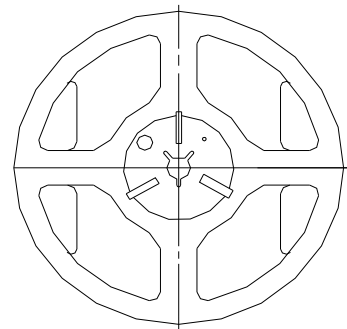
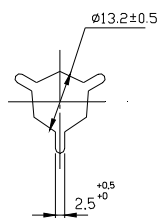


A-A SECTION

$$Ao = 1.8 \pm 0.10 \text{ mm}$$

$$Bo = 3.5 \pm 0.10 \text{ mm}$$

$$Ko = 0.87 \pm 0.10$$

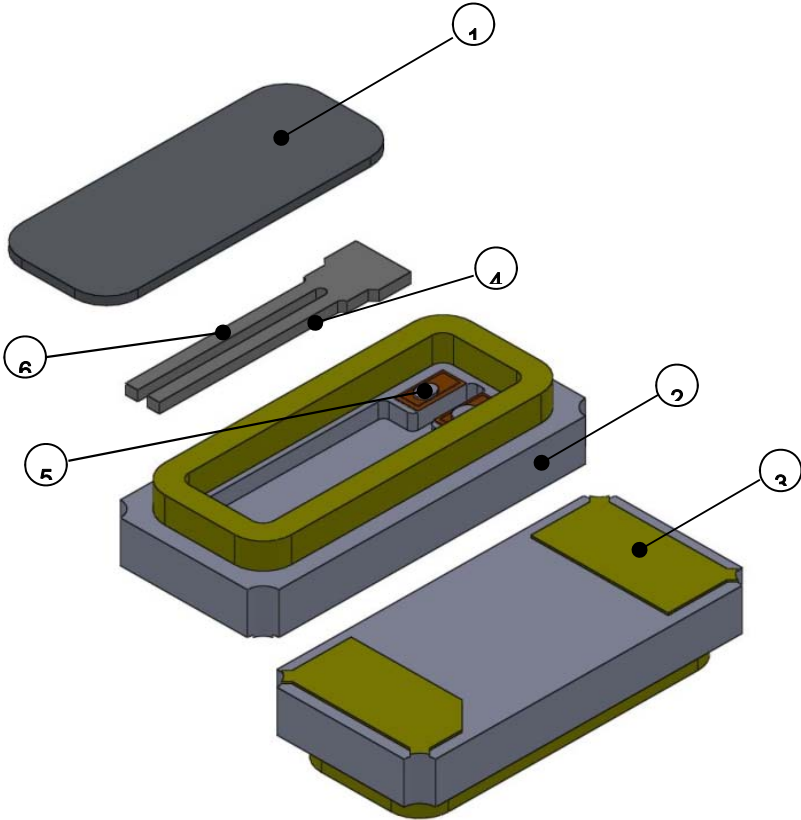


CARRIER TAPE DIMENSIONS	K1	P0	P1	P2	D0	D1	E	F	10P0	W	T	pcs / Reel
	-	4	4	2	1.55	1.1	1.75	5.5	40	12	0.25	3K

REEL DIMENSIONS	W	W1	L	L1
	16 ± 1.4	13 ± 0.3	$180 \pm 0/-3$	60.2 ± 0.5

- REMARK :
- 230 mm (9.05) minimum leader which consist of carrier and/or tape followed by a minimum of 160 mm (6.3) of empty carrier tape sealed with cover tape.
 - 160 mm (6.3) minimum trailer of empty carrier tape sealed with cover tape.

■ STRUCTURE ILLUSTRATION



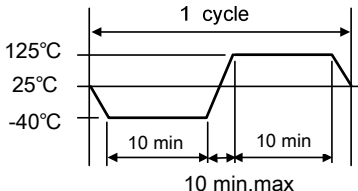
NO	COMPONENTS	MATERIALS	FINISH/SPECIFICATIONS
1	Lid	Kovar(Fe+Co+Ni) Alloy	-
2	Base(Package)	Ceramic(Al_2O_3)	Alumina Ceramics
3	PAD	Au	Tungsten metalize + Ni plating + Au plating
4	Crystal chip	SiO_2	-
5	Conductive adhesive	Ag	Silicon resin
6	Electrode	Au+Cr	-

■ RELIABILITY SPECIFICATIONS

1.Mechanical Endurance

No.	Test Item	Test Methods	REF. DOC
1	Drop Test	150 cm height, fall freely onto concrete floor 3 times.	MIL-STD-202
1	Mechanical Shock	Device are shocked to half sine wave (1000 G) three mutually perpendicular axes each 3 times. 0.5m sec. duration time	MIL-STD-202
1	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm,20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours)	MIL-STD-883
1	Solderability	Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	MIL-STD-883

2.Environmental Endurance

No.	Test Item	Test Methods	REF. DOC
2	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 ± 5 °C Test time 10 ± 1 sec.	MIL-STD-202
2	High Temp. Storage	+ 125 °C ± 3 °C for 1000 ± 12 hours	MIL-STD-883
2	Low Temp. Storage	- 40 °C ± 3 °C for 1000 ± 12 hours	MIL-STD-883
2	Thermal Shock	Total 100 cycles of the following temperature cycle 	MIL-STD-883
3	Pressure Cooker Storage	121 ± 3°C, RH100%, 2 bar, for 240 hours	EIA-JESD22
3	High Temp & Humidity	85°C ± 3°C, RH 85% , 1000Hrs	EIA-JESD22

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : $25\pm 5^{\circ}\text{C}$
Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature : $25\pm 3^{\circ}\text{C}$
Relative humidity : 40%~70%

Measurement condition

Electrical characteristics measured by S&A250B or equivalent.

NOTE:

1. STARWAVE requires one copy returned with signature and title of authorized individual that signifies acceptance of the attached specifications.
2. Orders received and accepted by STARWAVE after return of signed copy of specification will be produced per these specifications.
3. Any changes to these specifications must be agreed upon by both parties and new revision of the "Product Specification Sheet" will be issued.
4. Any issuance of purchase order prior to consigning back the approval page of "Specification Sheets" from customers will be regarded as the agreement on the contents of these specifications.
5. The green product standard set by STARWAVE is based upon the international standards. Related information is publicly described on the STARWAVE's website, and updated regularly. The document is compliant with the latest green product quality system directives at the time.
6. Revision "Sx" is for engineering samples only. PE/RD's approval required.
7. Revision "Ax" is production ready. PE, QA and MFG's approval required.
8. Inform STARWAVE in advance if you use ultrasonic welding in assembling process .

[STORAGE]

1. Don't be caught in the rain.
2. The storage environment shall be $5^{\circ}\text{C} \sim 40^{\circ}\text{C}$ temperature and 30% ~ 75%RH humidity and free from the sun shine.
3. If customers have special requirements, we can paste labels according to it.