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PRODUCT SPECIFICATION SHEET

CUSTOMER

PRODUCT TYPE : SMD TUNING FORK 1.6X1.0

NOMINAL FREQ. : 32.768000 KHz

FL P/N : 1SQ3270009-Q

REVISION : S0

CUSTOMER P/N :

CUSTOMER'S APPROVAL&DATE

[illegible]

FL CORPORATION

APPROVED	CHECKED	DESIGNED
Jay Lee	Jin Qi	May Zhang

MSL1

RoHS Compliant



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ATTACHMENT (optional)

- | | | | |
|------------------------------------|---|------------------------------|--|
| • ELECTRICAL CHARACTERISTICS TEST | A | ☐ YES | ☒ NO |
| • TEMPERATURE CHARACTERISTICS TEST | B | ☐ YES | ☒ NO |



FL P/N:

1SQ3270009-Q

VER:

S0

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PRODUCT DESCRIPTION

Standard atmospheric conditions

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

Ambient temperature $25\pm 2^{\circ}\text{C}$
Relative humidity 40%~70%

If there is no doubt the results, measurement shall be made within the following limits:

Ambient temperature $25\pm 2^{\circ}\text{C}$
Relative humidity : 40%~70%

Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

Crystal cutting type

The crystal is using AT CUT (thickness shear mode)

ELECTRICAL SPECIFICATIONS

No.	Items	Electrical Spec.					Remarks
		Symbol	Min	Typ	Max	Units	
1	Nominal Frequency	FL	32.768000			KHz	-
2	Load Capacitance	CL	7.0			pF	-
3	Frequency Tolerance	-	± 20			ppm	at $25\pm 3^{\circ}\text{C}$
4	Turnover Temperature	-	20	25	30	$^{\circ}\text{C}$	at $25\pm 5^{\circ}\text{C}$
5	Parabolic coefficient	-	$(-0.036\pm 10\%) \times 10^{-6}/^{\circ}\text{C}^2$				-
6	Shunt Capacitance	C0	-	1.2	-	pF	-
7	Motional Capacitance	C1	-	6.0	-	fF	-
8	Aging (/1 year)	-	± 3			ppm/year	at $25\pm 2^{\circ}\text{C}$
9	Operating Temperature	-	-40	-	85	$^{\circ}\text{C}$	-
10	Storage Temperature	-	-55	-	125	$^{\circ}\text{C}$	-
11	Equivalent series resistance	ESR	-	-	90	k Ω	-
12	Insulation Resistance	IR	500	-	-	M-ohms	at DC 100V
13	Drive Level	DL		0.1	0.5	μW	-



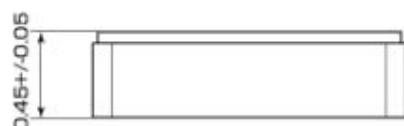
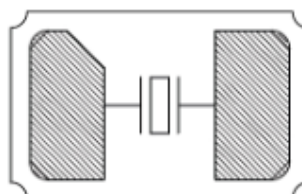
DIMENSIONS unit:mm

■ Dimensions[mm]



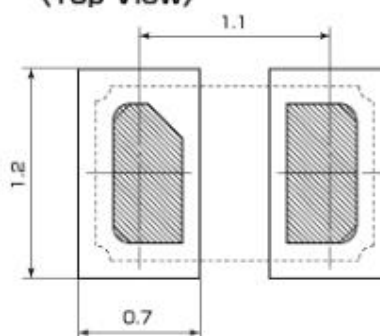
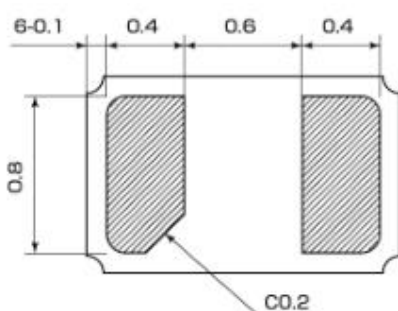
■ Internal Connections

〈Top View〉



■ Recommended Land Pattern [mm]

〈Top View〉



MARKING

S □ □ □ □

*1 *2 *3 *4 *5

*1 Model Name

*2 CL (6pF: A, 7pF: B, 9pF: J, 12.5pF: F)

*3 Year of Production(Last digit of year)

*4,5 Week of Production(01~ 52)

month year		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2017	2021	A	B	C	D	E	F	G	H	J	K	L	M
2018	2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2019	2023	a	b	c	d	e	f	g	h	j	k	l	m
2020	2024	n	p	q	r	s	t	u	v	w	x	y	z

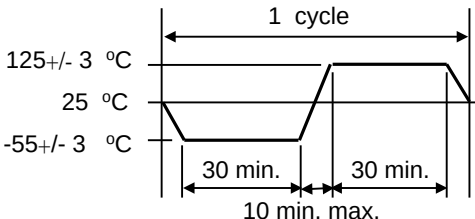


RELIABILITY SPECIFICATIONS

1.MECHANICAL ENDURANCE

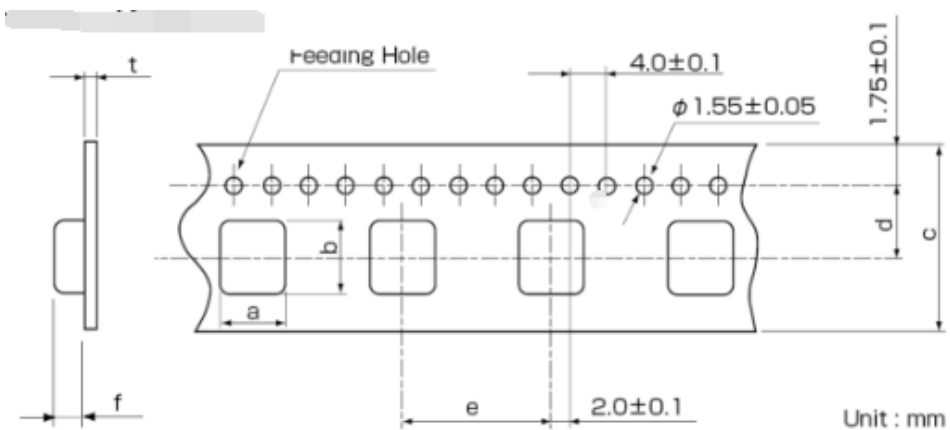
No.	Test Item	Test Methods	
1	Drop Test	150 cm height, fall freely onto stainless plate 3 times.	JIS C6701
2	Mechanical Shock	Device are shocked to half sine wave (1000 G) three mutually pendicular axes each 3 times. 1.0m sec. duration time	MIL-STD-202F
3	Vibration	Frequency range 10 ~ 55 Hz Amplitude 1.52 mm Pendicular axes each test time 2 hours (x,y,z Axis) Total test time 6 hours	MIL-STD-883E
4	Solderability	Temperature 260 °C ±5 °C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	GB/T 2424.17-2008 / IEC 60068-2-44:1995; GB/T 2423.28-2005 / IEC 60068-2-20:1979
5	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 +/- 5 °C Test time 5 +/- 1 sec.	MIL-STD-202F

2.ENVIRONMENTAL ENDURANCE

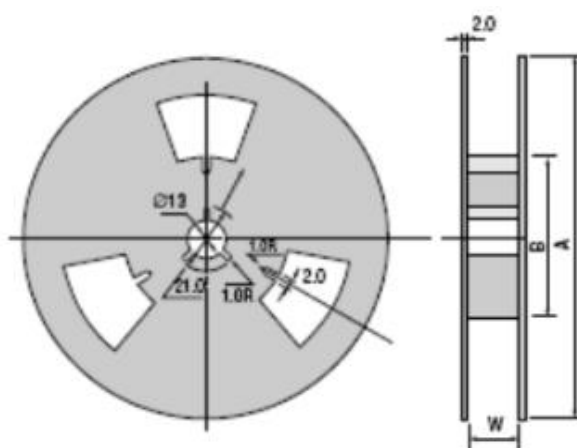
No.	Test Item	Test Methods	
6	High Temp. Storage	+ 125 °C +/- 3 °C for 500 +/- 12 hours	MIL-STD-883E
7	Low Temp. Storage	- 40 °C +/- 3 °C for 500 +/- 12 hours	
8	Thermal Shock	Total 100 cycles of the following temperature cycle 	MIL-STD-883E
9	High Temp&Homidity	85°C±3°C, RH 85%,500Hrs	JIS C5023



PACKING :



Dimension (Unit: mm)						
a	b	c	d	e	f	t
1.28	1.79	8	3.5	4	0.65	0.2
± 0.05	± 0.05	± 0.2	± 0.05	± 0.1	± 0.1	± 0.05



Dimension (Unit: mm)		
A	B	W
$\phi 180$	$\phi 60$	13

Range	Products	Packing Material
Banned Substances	Maximum concentration ppm(mg/kg)	Maximum concentration ppm(mg/kg)
1. 镉及镉化合物 Cadmium and cadmium compounds	100	100
2. 铅及铅化合物 Lead and lead compounds	1000	100
3. 汞及汞化合物 Mercury and mercury compounds	1000	100
4. 六价铬化合物 Hexavalent-Chromium VI (Cr+6)	1000	100
5. 聚溴联苯 PBB Polybrominated biphenyls	1000	N/A
6. 聚溴二苯醚 PBDE Polybrominated diphenyl ethers	1000	N/A
7. 邻苯二甲酸二(2-乙基己基)酯 DEHP Di (2-ethylhexyl) phthalate	1000	N/A
8. 邻苯二甲酸丁苄酯 BBP Butyl Benzyl Phthalate	1000	N/A
9. 邻苯二甲酸二丁酯 DBP Dibutyl Phthalate	1000	N/A
10 邻苯二甲酸二异丁酯 DIBP Diisobutyl Phthalate	1000	N/A
11. 氟 (F)、氯 (Cl)、溴 (Br)、碘 (I) Fluorine、Chlorine、Bromine、Iodine	900、900、900、900 注: Br+Cl<1000	N/A
12. 包装材料中重金属(汞、镉、六价铬、铅、PBB、PBDE)之总量 Heavy metals (mercury, cadmium, lead, Cr+6,PBB and PBDE) in packing materials	N/A	100 铅(Pb) + 镉(Cd) + 汞(Hg) + 六价铬 (Cr+6) <100ppm
13. 高度关注物质 SVHC-Substances of Very High Concern	1000	N/A

